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THE JOURNAL

OF THE

American Medical Association

Annual Subscription, $5.00 | PUBLISHED WEEKLY | Single Copies, 15 Cents

Vol. LXVIII, No. 7 | 535 North Dearborn Street, CHICAGO, ILL. | FEBRUARY 17, 1917

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ENTERED AS SECOND-CLASS MATTER, JUNE 25, 1885, AT THE POSTOFFICE AT CHICAGO, ILLINOIS, UNDER ACT OF MARCH 3, 1879.
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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXVIII, No. 7 CHICAGO, ILLINOIS FEBRUARY 17, 1917

THE RELATION OF THE ACID-BASE EQUILIBRIUM OF THE BODY TO CARBOHYDRATE METABOLISM

AND ITS APPLICATION IN HUMAN DIABETES *

FRANK P. UNDERHILL

NEW HAVEN, CONN.

A. THE RELATION OF THE ACID-BASE EQUILIBRIUM TO CARBOHYDRATE METABOLISM

Under normal conditions the content of blood sugar may be regarded as one of the body's constants. Transitory fluctuations may occur incident to ingestion of food, etc., but the variations encountered are confined within rather narrow limits. The exact mechanism controlling the constancy of the blood sugar content is unknown. It is well recognized, however, that a variety of agencies may temporarily throw out of equilibrium the blood sugar regulating mechanism producing either a state of hyperglycemia, with an accompanying glycosuria, or a condition of hypoglycemia in which sugar may or may not appear in the urine. The introduction into the organism of epinephrin may be cited as an example of the type of agents leading to the development of hyperglycemia and glycosuria. Phlorizin causes hypoglycemia with glycosuria, whereas hydrazin and phosphorus induce a diminished blood sugar content without the appearance of urinary sugar.

The mechanism regulating the level of blood sugar is peculiarly sensitive to disturbances in the acid-base equilibrium of the body. These may be manifested in either direction, namely, in conditions in which the equilibrium is overbalanced by excess of acid or deficiency of base (acidosis), or by circumstances leading to an overwhelming preponderance of base or temporary deficiency of acid (alkalosis). To avoid ambiguity it may be explained that the term "acidosis" is intended here to mean a disturbance in the acid-base equilibrium of the body whereby the introduction of, or the excessive production of, acid (ketogenic or otherwise) causes the withdrawal of base from the body. The term "alkalosis" is sufficiently clear to need no special definition.

Acid introduction or acid production in the body exerts a distinct influence on carbohydrate metabolism. This assertion is supported by the observation of Elias[1] that the ingestion of acid by dogs and rabbits leads to hyperglycemia and glycosuria. Elias[2] has also concluded that the so-called "hunger diabetes" of young dogs, as described by Hofmeister,[3] is in part, at least, a condition due to acidosis, as indicated by the lowered carbon dioxid content of the blood and of the alveolar air. In human diabetes also it is conceded that acidosis arises. This brief review of the literature on the subject makes it evident that the introduction of acid or the production of acid in the organism is associated with a disturbance of blood sugar content which is manifested in one direction, namely, blood sugar content is augmented.

On the other hand, a state of alkalosis is likewise potent in exerting an influence on carbohydrate metabolism, but this action is contrary to that of acidosis. That alkali introduction influences carbohydrate regulation in the body was demonstrated by Pavy and Godden,[4] who found that the glycosuria provoked by ether or chloroform disappears after the intravenous injection of sodium carbonate. Given by mouth or intravenously, sodium carbonate will abolish the hyperglycemia of "hunger diabetes"; and according to Elias,[2] the glycosuria will either entirely disappear or be greatly diminished. After removal of the pancreas, sodium carbonate introduced into the blood stream of the dog causes a diminution of the sugar excretion.[5] Murlin and Kramer[6] showed that under the influence of sodium hydroxid the respiratory quotient is increased in depancreatized dogs. In agreement with this finding are the results of Kramer and Marker,[7] who have stated that "sugar retained when sodium carbonate is administered to depancreatized dogs is not stored as glycogen nor is it eliminated by way of the saliva or the gastro-intestinal tract." These observations[8] indicate that alkali introduction facilitates sugar combustion in the depancreatized dog.

The explanation for the closely agreeing observations just cited probably lies in the effect which sodium carbonate exerts at times on the blood sugar content of normal animals. The intravenous injection of sodium carbonate may cause, although not invariably, a marked diminution in the blood sugar content[9] of rabbits. When blood sugar content is affected, the diminution is transient, the normal being regained within one or two hours. Moreover, the hyperglycemia and glyco-

* From the Sheffield Laboratory of Physiological Chemistry, Yale University.

* Reported to the Society for Experimental Biology and Medicine, March 15, 1916. Compare Proc. Soc. Exper. Biol. and Med., 1916, 13, 111.

1. Elias: Biochem. Ztschr., 1912-1913, **48**, 120.
2. Elias and Kolb: Biochem. Ztschr., 1913, **52**, 331.
3. Hofmeister: Arch. f. exper. Path. u. Pharmakol., 1889-1890, **26**, 355.
4. Pavy and Godden: Jour. Physiol., 1911-1912, **43**, vii.
5. Murlin and Kramer: Jour. Biol. Chem., 1913, **15**, 365; 1916, **27**, 481.
6. Murlin and Kramer: Jour. Biol. Chem., 1916, **24**, xxv; 1916, **27**, 517.
7. Kramer and Marker: Jour. Biol. Chem., 1916, **29**, xxiv; 1916, **27**, 499.
8. More recently Murlin and Craver (Jour. Biol. Chem., 1916, **28**, 289) have asserted that intraduodenal infusion of sodium carbonate in human diabetes causes a distinct reduction of glycosuria. On the other hand, similar treatment with sodium bicarbonate has the opposite effect.
9. Underhill: Jour. Biol. Chem., 1916, **25**, 463.

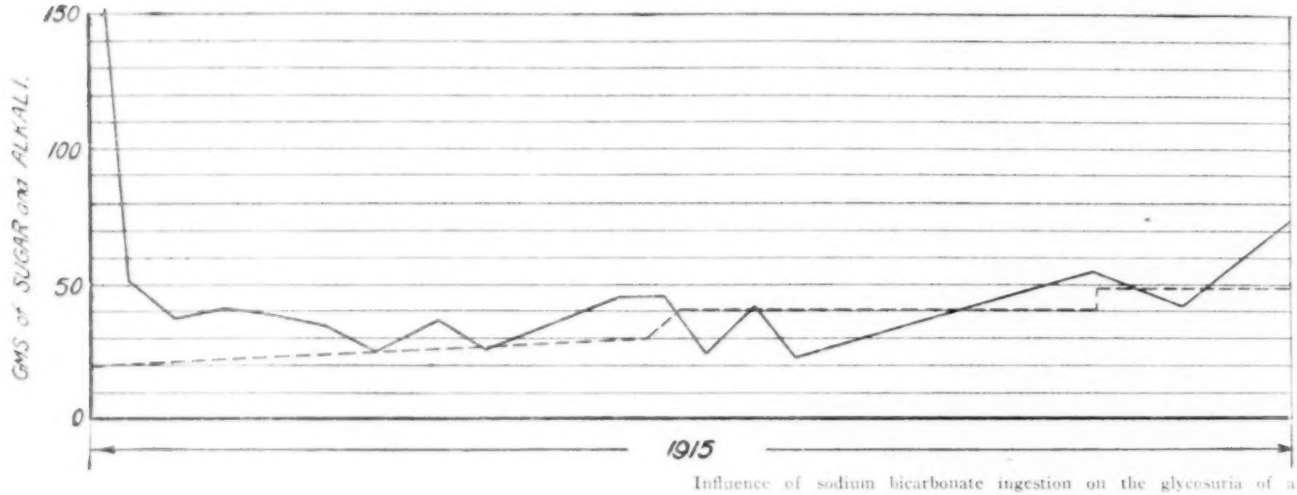
suria provoked in rabbits by epinephrin[10] are both significantly decreased if sodium carbonate has been administered at suitable periods of time previous to epinephrin administration.

The regulation of blood sugar content would thus appear to be associated in part at least with the equilibrium between acids and bases in the body. Acid tends to increase blood sugar content; acid has an influence in causing sugar elimination. On the other hand, base or alkali tends to reduce the blood sugar content. These ideas fit in well with facts concerning other conditions associated with carbohydrate metabolism. Underhill and Blatherwick[10] have shown that previous to the tetany provoked by removal of the thyroid-parathyroid mechanism, blood sugar content may be greatly diminished. Calcium relieves the tetany and restores blood sugar to normal. In the disturbance of carbohydrate metabolism induced by epinephrin, calcium[11] causes a distinct change in the character of the curve of hyperglycemia, and markedly increases the amount of sugar appearing in the urine under the stimulus of epinephrin administration. In other words, calcium behaves in a manner analogous to hydrochloric acid. Wilson[12] and his co-workers had previously found that prior to the onset of tetany after removal of the thyroids and parathyroids a condition of alkalosis develops. The introduction of acid relieves the symptoms equally as well as calcium administration. The period of alkalosis corresponds fairly well with the interval of low blood sugar observed by Underhill and Blatherwick. In view of these facts, it is probable that the condition of alkalosis may be responsible for the accompanying hypoglycemia. The resumption of normal blood sugar content is induced by introduction of either calcium or hydrochloric acid, which have a common behavior in increasing blood sugar content under appropriate conditions. The introduction into the dog of the diamin, hydrazin, results in a transitory decrease in the percentage of sugar in the blood[13] with an accompanying increase of the respiratory quotient.[14] At the period of hypoglycemia, the excreted urine exhibits a strongly alkaline[15] reaction, probably owing to carbonates.

These observations lead to the conclusion that a condition of acidosis facilitates the elimination of carbohydrate from the body, whereas in alkalosis there is a tendency to conserve carbohydrate.

B. THE APPLICATION OF THE IDEAS CONCERNING ACID-BASE EQUILIBRIUM TO HUMAN DIABETES

If the ideas reviewed above concerning acid-base equilibrium in its relation to carbohydrate metabolism are applied to human diabetes, one gains the following conception of its chemical pathology: Without reference to what may initiate the abnormal condition, a state of acidosis unquestionably develops and must tend to become aggravated, if anything, by the characteristic acid-producing foods of the conventional diabetic dietary. In general, meats and cereals are acid-producing foodstuffs; vegetables and fruits, on the other hand, usually yield an excess of base. Those foodstuffs which are richest in base-producing substances are forbidden to the diabetic individual because they contain relatively large quantities of carbohydrates. The conventional diabetic dietary, consisting largely of meats and other protein foods and fats, would therefore have a decided tendency to aggravate the condition of acidosis induced by the abnormal state. From what has been pointed out already, it seems reasonable to conclude that anything which will counteract or neutralize the continuous stream of acid entering the body should benefit the individual. One is led to ask, What influence would this have on the excretion of sugar if the organism were once saturated, so to speak, with alkali and enough alkali continually supplied to neutralize the exogenous and endogenous acid? These considerations have been put to the test in a human diabetic, aged 26 years, with a very severe type of diabetes.



Influence of sodium bicarbonate ingestion on the glycosuria of a

CASE 1.—A young university instructor had been aware of his condition for several months, and although he had received medical aid and was on a so-called "diabetic diet," his condition was steadily growing worse. He first came under my observation, Jan. 4, 1915, and at this time was excreting more than 150 gm. of glucose per day, although on a "diabetic diet." The urine contained large quantities of acetone and diacetic acid, and the subject was losing weight rapidly. The body weight, Jan. 4, 1915, was 146 pounds.

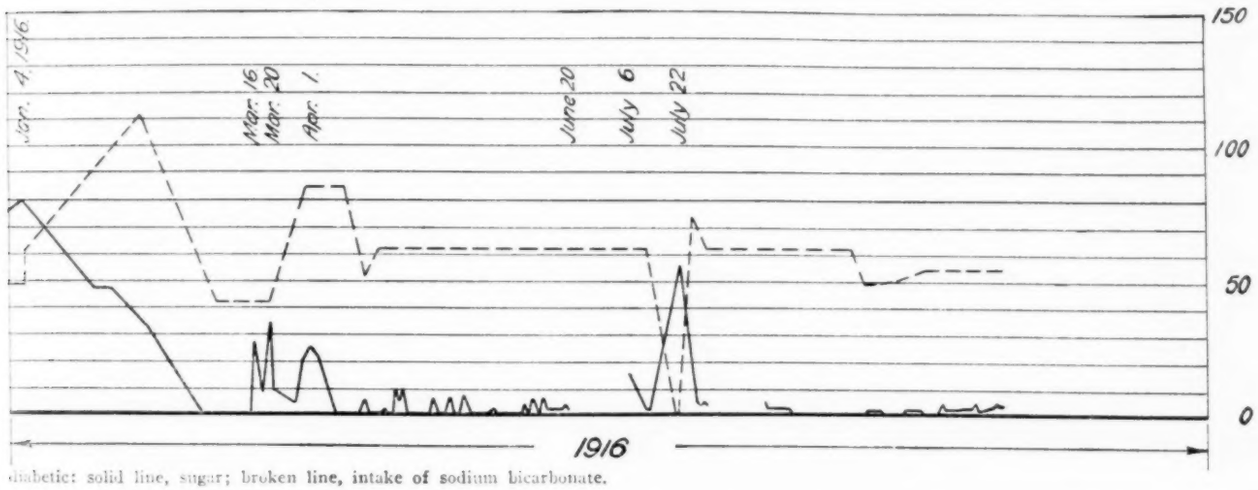
Dietetic Treatment.—By restriction of the diet to the point at which little or no carbohydrate was consciously ingested, in accordance with the suggestions of Joslin's dietary chart, the daily output of sugar was reduced to from 25 to 50 gm.,

10. Underhill and Blatherwick: Jour. Biol. Chem., 1914, **18**, 87; **19**, 119.
11. Underhill: Jour. Biol. Chem., 1916, **25**, 447.
12. Wilson, Stearns and Thurlow: Jour. Biol. Chem., 1915, **23**, 109. Wilson, Stearns and Janney: Ibid., 1915, **23**, 123.
13. Underhill: Jour. Biol. Chem., 1911, **10**, 159.
14. Underhill and Murlin: Jour. Biol. Chem., 1915, **22**, 499.
15. Underhill and Bauman: Jour. Biol. Chem., 1916, **27**, 151.

acetone and diacetic acid always being present in relatively large quantities. Sodium bicarbonate in small amounts was given for the purpose of neutralizing the ketogenic substances in accordance with the usual therapeutic practice. After a year's interval, in spite of very stringent dietary restrictions, the sugar excretion suddenly increased to from 70 to 80 gm. daily. The progress of the subject during the period of a year may be seen from the chart.

The Influence of Large Doses of Sodium Bicarbonate on Sugar Excretion.—At this period (Jan. 4, 1916) of high sugar excretion, gradually increasing doses of sodium bicarbonate were given to a maximum of 120 gm. per day. This treatment resulted in *a gradual diminution of sugar output until the urine became sugar free* (see chart). The dosage of sodium bicarbonate was thereupon decreased at the rate of 7 gm. per day until the intake amounted to 42 gm. per day. Under these conditions the urine remained sugar-free for a period of seventeen days (see chart), during which interval the food ingested was augmented to the point at which about 10 gm. of carbohydrate in addition to that present in the previous strict diet were ingested daily. Acetone and diacetic acid were still present, but in greatly diminished amounts, and the urine was strongly alkaline in reaction. The volume of urine voided daily varied between 2 and 3 liters.

With the idea of determining the tolerance of the patient toward a large quantity of sugar, a portion of grapefruit



diabetic: solid line, sugar; broken line, intake of sodium bicarbonate.

was added to the diet. The quantity of sugar ingested amounted to 26 gm. As is apparent from the chart (March 16), an equivalent quantity of sugar promptly appeared in the urine but quickly fell to less than 10 gm. March 20, a second sharp rise may be noted, the sugar output being caused by the patient breaking over his diet and eating indiscriminately. The third sharp rise (see chart, April 1) in the output of sugar is associated with a severe attack of bronchitis. The patient was confined to his home for a period of thirty-one days during which it was deemed advisable to increase temporarily the intake of alkali. This had as a result a drop in sugar excretion to the zero point. From that period until June 20 the sugar output fluctuated from zero to 10 gm. per day. The break in the sugar curve represents a vacation period. In the period just previous to the June vacation, no strenuous attempt was made to keep the urine sugar-free. The larger figures represent either indiscretions in diet or are associated with particularly strenuous days in which nervous tension was unduly pronounced. On his return from vacation in July (July 6), the sugar excretion was approximately 15 gm., which by proper regulation of the diet quickly fell to 2 gm.

The Influence of Alkali Withdrawal on Sugar Excretion.—In order to determine the influence of the alkali therapy on the sugar excretion from a different point of view, the patient was maintained on a constant diet on which never more than 2 gm. of sugar appeared in the urine, and the alkali was then gradually withdrawn. As may be seen from the chart, *glycosuria steadily increased as the alkali was decreased, until at the period* (July 22) *when no alkali was ingested nearly 60 gm. of sugar were excreted per day.* During this interval the patient was obliged to lie down most of the time, owing to great weakness, and on one occasion had a "fainting spell." At the solicitation of the family the experiment was carried no further. *alkali was again administered, the diet remaining unchanged, and, as may be seen from the chart, the sugar excretion fell rapidly to the zero mark.* The subject speedily regained his sense of strength and well being, which has been maintained to the present time (November 10).

The Degree of Acidosis of the Patient.—During the autumn of 1916 the chart shows a slight upward tendency of sugar excretion. This may be explained by the fact that the patient is receiving a relatively small alkali intake, 49 gm. per day. There is little doubt that with a larger daily ingestion of sodium bicarbonate the urine could be made sugar-free. The main reason that the alkali intake has not been increased is that 49 gm. of sodium bicarbonate just suffices to keep the urine near the point of neutrality. When the alkali was entirely withdrawn, a test was made to determine how much alkali was necessary in order to overcome the acidosis of the subject, that is, the amount of alkali sufficient to render the urine alkaline. Ingested at seven intervals during the waking hours, 49 gm. of sodium bicarbonate just yielded an alkaline urine. This is the minimum amount necessary to keep the urine at the point at which it is either faintly alkaline or faintly acid to litmus. When it is remembered that in normal man at most 15 gm. of sodium bicarbonate are sufficient to render the urine alkaline, it is evident that in the present instance a severe acidosis is present. Acetone and diacetic acid are always to be found in the urine, but not in large quantities.

Body Weight.—During the period of alkali administration, body weight of the subject has fluctuated between 124 and 135 pounds. The attack of bronchitis referred to above caused a loss of weight of about 10 pounds. At present (November 10) the body weight is 131 pounds.

Food Intake.—Calculation of the food intake shows the patient to be receiving approximately from 15 to 18 gm. of nitrogen and 2,400 calories.

Method of Alkali Administration.—Sodium bicarbonate dissolved in water is very likely to cause nausea and vomiting. If the alkali is dissolved in a little water and ordinary carbonated water is added, the mixture may be drunk with no bad effects. So far as can be discovered, the ingestion of large doses of sodium bicarbonate over a long period of time has caused no injury or untoward symptoms of any sort. In order to keep a stream of alkali entering the tissues more or less constantly, sodium bicarbonate is taken in seven equal doses at approximately equal periods during the waking hours. The urine secreted during the night remains alkaline.

THE INFLUENCE OF SODIUM BICARBONATE IN A MILD FORM OF DIABETES

The most striking effects of alkali administration in diabetes are encountered in the very severe cases, as might naturally be expected, because of the greater degree of acidosis. In patients with a well defined tolerance to carbohydrate, the influence of alkali treatment may be seen, however, and there is also some evidence of an increased tolerance under the treatment.

CASE 2.—A Jewish woman, aged 42, with a history of diabetes of several years' standing, for a period of at least two years had had her dietary arranged by me in such a manner that on a typical strict diabetic diet the urine became sugar-free. Acetone and diacetic acid were never present. With the addition of three thin slices of baker's bread (weighing approximately 15 gm. each) the urinary sugar increased to between 2 and 3 gm. Four slices of bread during the day caused an output of between 18 and 21 gm. of sugar.

Slowly increasing doses of sodium bicarbonate (up to 50 gm.) on the strict diet plus three slices of bread maintained this patient sugar-free for a period of two days, at the end of which four slices of bread were given with an output of 5.4 gm. of sugar. With five slices of bread the sugar excreted amounted to 6 gm. Six slices of bread caused a urinary sugar excretion of 6.8 gm., approximately one-third that usually put out on four slices of bread when no alkali was given. It is apparent from these data that the carbonate administration permitted a much greater tolerance than obtained when no alkali was given.

CONCLUSIONS

The ingestion of large doses of sodium bicarbonate has a marked influence in decreasing glycosuria in severe diabetes, and in maintaining the diabetic individual in a state of comparatively good health and vigor. This effect is ascribed to the neutralization of the exogenous and endogenous acid of the organism.

In mild diabetes there is evidence that carbohydrate tolerance may be significantly increased by large doses.

These conclusions are in harmony with experimental facts concerning the relation of acid-base equilibrium of the body to carbohydrate metabolism.

THE RELATIVE FREQUENCY OF THE VARIOUS CAUSES OF COMA*

WAYNE W. BISSELL, M.D.
AND
E. R. LeCOUNT, M.D.
Resident Pathologist and Attending Pathologist, Respectively, Cook County Hospital
CHICAGO

In 1915 we presented[1] the results of study of 200 deaths in coma, with special reference to the clinical diagnosis of uremia. During the past year we have been able to review the clinical records of an additional 200 persons dying in semiconsciousness or coma and, as in the first series, one of us (E. R. L.) has examined all the bodies. In grouping these 400 deaths in coma, the possibility of aiding diagnosis of the various forms of coma, particularly in the practice of large hospitals receiving a great deal of so-called emergency work, has been kept in mind. We further believe that a presentation of the diagnosis efficiency of clinicians in the Cook County Hospital, and especially the improvement since the first report, will compare favorably with similar statistics from other large hospitals admitting many persons in some degree of coma.

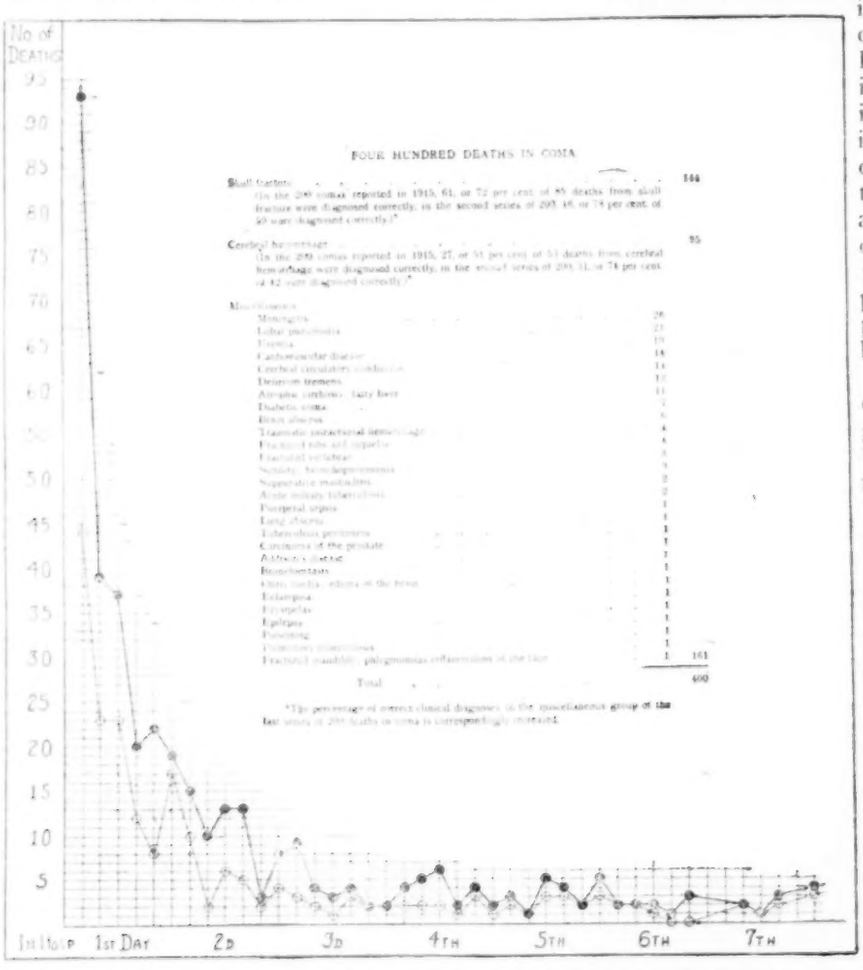

No. of Deaths
FOUR HUNDRED DEATHS IN COMA
Skull fracture 144
Cerebral hemorrhage 95
Miscellaneous
Total 161 600
In Hosp. 1st Day 2D 3D 4TH 5TH 6TH 7TH

Chart 1.—Correct diagnoses in 400 deaths from coma: heavy line, deaths; light line, number correctly diagnosed. In this chart, twenty-one deaths in coma are not plotted; they occurred as follows: 6 on the eighth day, 3 on the ninth, 4 on the tenth, 1 on the eleventh, 1 on the twelfth, 1 on the thirteenth, 1 on the fourteenth, 1 on the seventeenth, 1 on the twenty-second, 1 on the twenty-eighth, and 1 on the thirty-first day. The clinical diagnoses were correct in eleven of these.

As in our first consideration, we think the conditions are best represented by charts which take into account not only the number of deaths, but also the time allowed for clinical study and the number of correct diagnoses.

In Chart 1, the upper heavy line represents the number of deaths per four hour period, and the lower light line, the number of each of these groups receiving correct clinical diagnoses. Thus, it can be seen, ninety-

* From the Cook County Hospital.

* A report made at the regular monthly staff meeting, April 13, 1916.

1. Bissell, W. W., and LeCount, E. R.: A Consideration of the Relative Frequency of the Various Forms of Coma, with Special Reference to Uremia, THE JOURNAL A. M. A., March 27, 1915, p. 1041.

three died within four hours after entrance into the hospital, and of these, forty-four, or 47.3 per cent., were correctly diagnosed clinically. Thirty-nine died between four and eight hours after admission, and twenty-three, or 58.9 per cent., of these received correct clinical diagnoses. Similarly, 230 died within twenty-four hours after admission, and of these, 127, or 55.2 per cent., received correct clinical diagnoses. Twenty-four died on the third day of observation, and of these thirteen, or 54.16 per cent., received correct clinical diagnoses.

The abrupt descent of both curves from the first four hours to the end of the third day is a most graphic expression of the high and rapid mortality of persons entering the Cook County Hospital in coma. From the fourth to the thirty-first day, eighty-four died, and of these, forty-nine, or 58.33 per cent., were diagnosed correctly.

The various causes of coma as determined by postmortem examination and the number of times each cause was found are tabulated in the center of the chart. From analysis of this chart it seems reasonable to conclude that more than half of the persons entering the Cook County Hospital in coma die during the first twenty-four hours after admission, but few live longer than one week, and, in this series at least, the accuracy of the clinical diagnosis is little affected by the element of time.

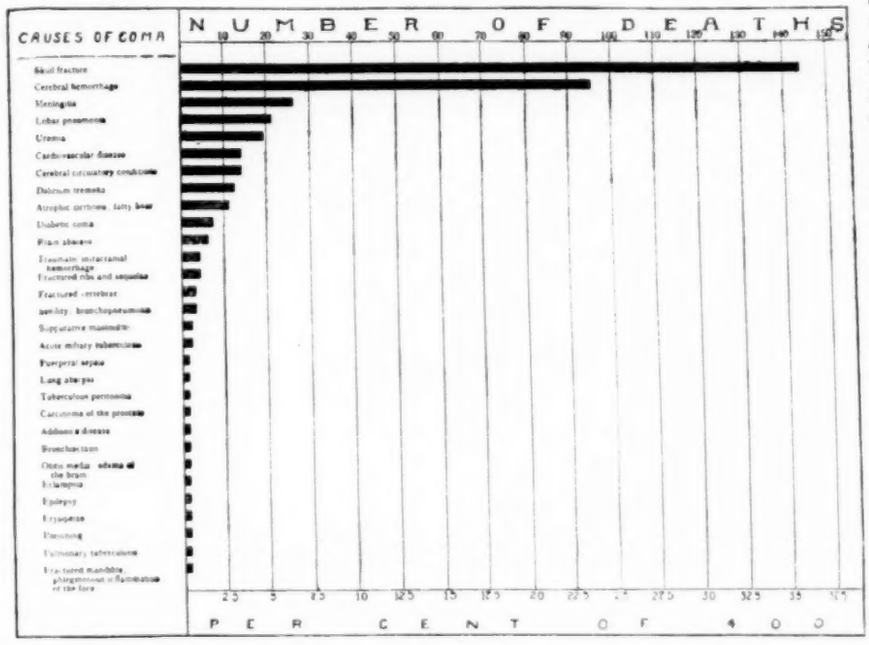


Chart 2.—Various causes of coma as determined by postmortem examination.

In reading in Chart 1 the list of causes of coma with conditions which also produced death, it is noticeable that we have listed none of the common poisonings, such as the corrosives, illuminating gas or morphin. Because either from history or obvious corrosion the vast majority of such persons enter the hospital with a diagnosis correctly made, we have omitted these instances of coma from consideration, and for like reasons we have not taken into account a rather large number of comas due to extensive and externally obvious injuries.

In Chart 2 we have arranged in order of frequency the various causes of coma as determined by postmortem examination. Reading from above downward, the lengths of the heavy black bars can be read in numbers, or, reading from below, in percentages of 400. Thus, 144, or 36 per cent., of these 400 persons entering the Cook County Hospital in coma which terminated fatally were comatose from skull fracture; ninety-five, or nearly 24 per cent., of these 400 from cerebral hemorrhage. It is most interesting to note that less than 5 per cent. of all these instances of coma were due to uremia, and it is similarly interesting to observe that, as a cause of coma, lobar pneumonia takes a position preceding uremia.

It is also apparent that 239, or 59.75 per cent., of these deaths in coma were due to skull fracture or cerebral hemorrhage, and of these, 165, or 69 per cent., received correct clinical diagnoses. The frequency with which skull fracture is observed with insignificant external injuries, and the common finding of bloody cerebrospinal fluid in persons comatose from spontaneous intracerebral hemorrhage lead us to believe that the diagnosis efficiency for skull fracture and cerebral hemorrhage is clinically very high.

We wish to emphasize the value of such reviews as this to stimulate resident and attending members of staffs of large hospitals to make accurate, rapid clinical diagnosis.

Passing of Tubercle Bacillus.—And, finally, however large you may make the tuberculous population of a given community if you subtract, as preventable causes, those cases born of the preventable contagious diseases, especially those specifically liable to be complicated by tuberculosis, those cases developed because of drug, drink, or other abuses, those developed as the result of unhygienic conditions and unsanitary surroundings, those developed because of food deficiency or irregularity or of faults of metabolism, those developed and spread by wilfulness, carelessness, or ignorance of known cases, those spread from unknown cases, those contracted because of the lack of those elements of culture demanded by modern society, those contracted because of the lack of proper quarantine of active cases, and those contracted from infected milk or other food supply, your tubercle will have petered out and passed away. The few remaining cases for whom one of these preventable causes could not be found will be so small as to be negligible. And if the reduction has been accomplished up to this point who is there to say that it cannot be entirely eradicated? Why not? Even more virulent diseases, more sturdy bacteria, have been eradicated.

There was a time when such diseases as smallpox, cholera, plague, and the like had far larger populations and far greater death rates than tuberculosis—and they are gone. Because the tubercle bacilli never attack the robust or unreenforced, every stride in the improvement of hygienic conditions, every improvement in physical condition and physical development, and every stride forward in preventive medicine will limit the range of operation of the tubercle bacillus. Who can still say that tuberculosis is not the most preventable, the least contagious, and the most amenable to cure?—H. M. Friedman, *Journal of the Outdoor Life*, December, 1916.

HEREDITARY DEFORMING CHONDRODYSPLASIA—MULTIPLE CARTILAGINOUS EXOSTOSES

A REVIEW OF THE AMERICAN LITERATURE AND REPORT OF TWELVE CASES *

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In the fall of 1914 a case of multiple cartilaginous exostoses, so called, appeared during my service at the Children's Hospital. With the permission of Dr. Lovett I investigated the case clinically and roentgenologically, and removed a strip of bone from across an affected epiphysis for pathologic study. The results of this investigation were presented in an article[1] published in May, 1915.

In reviewing the literature, I found that although the disease is generally considered rare, and textbooks in English give little or no place to it, more than 600 cases had been reported from all over the world, and about 350 articles had been written on the subject. The American literature I found to be very scanty.

As a logical sequence to my previous article, I proposed to discover if possible how frequent the condition really was in this country, and what its clinical and roentgenologic manifestations were. Accordingly I present herewith (1) a review of cases hitherto reported in the United States; (2) a report of a series of personal cases; (3) observations as to the character and occurrence of the disease based on these cases, and (4) conclusions.

REPORTED CASES

The first case reported in this country was by Gibney.[2] In 1875 he showed a boy of 13 who presented the typical picture. At 7 years he had been confined in bed for a long while with "acute rheumatism," and at 10 years he had recurring pain in his right hip. Gibney[3] presented this patient again in 1879. At this time he showed several new exostoses, and some of those formerly present seemed to have increased in size.

In 1876 in an article on the subject, Gibney[4] presented a family consisting of a Prussian of 34 who had many large irregular hyperostoses, with subluxation of one finger and left genu valgum. Over some of the hyperostoses the skin was cicatrized, representing ulceration from friction. The growths were said to have reached a maximum size at puberty, since which time many were said to have decreased in size. His father and brother were said to be affected, and his daughter of 11, son of 9, and daughter of 4 were presented as well defined cases. This is the first family reported in this country, and it is interesting because in the first generation there is one person affected, in the second two, and in the third three.

In 1889 Leidy[5] reported a case in an Irish girl of 25 who presented multiple bony tumors, those about the knee being unusually large, causing pain and interference in walking. There is no statement concerning heredity.

Wright,[6] in 1887, showed a boy of 11 presenting the typical picture.

Davis,[7] in 1905, reported two cases; one a man of 53, no hereditary history ascertained, presenting typical knock knee, curved and shortened forearms with displacement of the carpi, subluxation of a finger, pes valgus, rosary and enlargement of the spines of the seventh cervical and first and second thoracic vertebrae. He came under observation on account of suppuration of an exostosis of the femur. This case is interesting because during a year, under the observation of Dr. Davis, a small growth on the ramus of the left pubis diminished noticeably in size. The second case was a child of 3, with rosary, knockknee, etc. No family history was obtained.

In the discussion of this paper, Dr. H. L. Taylor reported a family in which the father was probably affected, a boy of 12, a girl of 10, and a boy of 8, definitely so. A. H. Freiburg described a case in a man of 80, who was operated on for popliteal aneurysm caused by friction of an exostosis. In this patient the family history went back three generations. Dr. D. D. Ashley reported a girl of 11 and a boy of 9 affected, with a history of the affection reaching back to include the mother, grandmother and great-grandmother.

In 1907, Ochsner and Rothstein[8] reported an interesting case of intraspinal exostosis. The patient was a man, aged 23, without known hereditary history, in whom the condition was noted at the age of 2; 108 exostoses were counted, including an unusual one on the left superior curved line of the occiput. The patient stated that these exostoses grew at the same rate as he did until the age of 19, when they stopped. At 14 he began to have incoordination of the lower extremities, which condition grew worse so that during the past year the upper extremities were involved and there was pain on the right side of the body on turning the head to the right. Rothstein diagnosed an exostosis within the spinal canal on the right side, and at operation his diagnosis was confirmed and an intradural pediculated tumor, which was flattening the cord, was removed from the anterior aspect of the right lamina of the second cervical vertebra. The operation was unfortunately followed by quadriplegia with loss of bladder and bowel function, from which condition the patient gradually improved, so that he was walking with crutches at the time of the report.

Clark and Atwood,[9] the same year, in a series of interesting neurologic cases, reported one as "a case of multiple enchondroma, one of which is growing from the sella turcica, causing pressure on the pituitary body." The patient was a boy of 17 with spastic

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on request.

1. Ehrenfried, Albert: Multiple Cartilaginous Exostoses—Hereditary Deforming Chondrodysplasia, THE JOURNAL A. M. A., May 15, 1915, p. 1642.

2. Gibney, V. P.: Multiple Exostoses, Med. Rec., New York, 1875, **10**, 300.

3. Gibney, V. P.: Multiple Exostoses, Med. Rec., New York, 1879, **15**, 589.

4. Gibney, V. P.: Hereditary Multiple Exostoses, Am. Jour. Med. Sc., 1876, **72**, 73.

5. Leidy, Joseph, Jr.: An Unique Case of Multiple Exostoses, Tr. Path. Soc., Philadelphia (1887-1891), 1891, **14**, 5; Univ. Med. Mag., Philadelphia, 1888-1889, **1**, 230.

6. Wright, J. W.: Multiple Asymmetrical Spongy Exostoses, New York Med. Jour., 1887, **45**, 358.

7. Davis, G. G.: Multiple Cancellous Exostoses, Am. Jour. Orthop. Surg., 1905-1906, **3**, 234.

8. Ochsner, E. H., and Rothstein, T.: Multiple Exostoses, Including an Exostosis Within the Spinal Canal, with Surgical and Neurological Observations, Ann. Surg., 1907, **46**, 608.

9. Clark, L. P., and Atwood, C. E.: A Report of Cases of Landouzy-Déjerine Myopathy (Congenital), Thomsen's Disease, and Enchondroma of the Hypophysis, New York Med. Jour., 1907, **86**, 97.

quadriplegia, the same one described later by Oberndorf.

Withington,[10] in 1907, showed an Italian, aged about 35, who was suffering from acute articular rheumatism; multiple exostoses were found on examination, and were said to have existed since early childhood. No history of heredity was made.

Oberndorf,[11] in 1910, described in some detail the case already reported by Clark and Atwood. The boy was of German parentage, aged 19 years. No history of heredity was noted, but the father and mother were second cousins. The condition was first noted at 4 years, and the mother said that many growths had appeared and vanished spontaneously. One rapidly growing tumor over the precordium was removed at the age of 11 by McBurney, and the pathologic diagnosis of enchondroma was made. The boy suffered from acute rheumatism at the age of 12. He had a scoliosis with some apparent kyphosis and forty palpable masses. The hands and feet were increased in size and the finger tips were blunt and spadelike, suggesting acromegaly. Oberndorf considered this due to a growth in relation to the sella turcica causing pressure on the pituitary body. For the past three years the patient had suffered from a marked syringomyelia, and some months after his coming under observation died of inanition, complicated by bedsores.

Coon,[12] in 1912, reported the case of a boy of 15 without hereditary history. He presented an atypical picture. The deformities affected particularly the right leg and arm. The left limbs showed mild bony changes on Roentgen examination, but were practically without deformity. In the fingers of both hands, roentgenoscopy revealed chondromatous masses involving the metaphyseal ends of the phalanges; in the right forearm the shortening appeared in the radius, rather than in the ulna, where it usually occurs. The lower end of the radius showed typical broadening and striation of the metaphyseal extremity with distortion of the epiphyseal line. The same was true of the right shoulder, knee and ankle.

Boggs,[13] in 1913, reported the case of a man, aged 23, who was said to have been born with bony tumors, and whose father had bony tumors. Roentgenoscopy revealed the characteristic clinical picture, with a normal sella turcica. The patient had been blind for about a year, and the legs had become weak eight months before he came under observation. There was moderate double optic atrophy. The thyroid gland was not made out. The case was reported as one of multiple congenital osteochondromas with thyroid atrophy, degeneration in the acoustic and optic nerves, and muscular atrophy.

In 1913, Vaughan[14] emphasized the hereditary nature of multiple exostoses.

Carman and Fisher, in 1915,[15] reported the case of a man, aged 23, in whom no heredity was ascertained. It was noticed at birth that the arms were thick at the elbows and wrists. The bony tumors were not particularly noticeable until the age of 8, when they began to grow, and continued to increase parallel to skeletal development until about 22, when growth ceased. He came under observation on account of an irritation abscess over an exostosis on the clavicle. He was 5 feet 9 inches tall, and showed bony growths generally distributed, including the jaw, costochondral junction (rosary), and scapulae. He had scoliosis, relative shortening of the left arm and leg, moderate flatfoot, synostosis and clubbing of fingers and toes, and asymmetry of the toes. An exostosis within the pelvis was felt by rectal examination. The forearms were exceedingly deformed and short, the right showing the typical deformity in moderate degree and the left showing an exceeding degree of hyperostosis at the lower end of the shafts of the radius and ulna, with the hand dislocated inward and the upper end of the radius dislocated outward. The ulna being extremely short, the length of the relatively long radius was taken up by a spiral twist of the radius about the ulna.

Percy, in 1915,[16] reported a case of a boy of 17 of stocky build, in whom the first tumor was noticed at 4 years, and who presented growths on the upper arms, knees and legs. All the joints were enlarged, and the bones of the hands and feet were short, stubby and nodular. On the inner aspect of the right arm was a cauliflower chondro-osteoma the size of a cocoanut, which had grown markedly during the past three years. This was removed by operation. The boy's grandfather, who was born in Holland, was said to have been affected with the disease, and Dr. Percy investigated his descendants. He found that these numbered 113, of whom 26 were affected, 73 not affected and 14 unknown. Of those affected, 22 were males and 4 females. Transmission through affected males and females was about in the relative proportion of those affected, but in two cases the disease was transmitted through unaffected females. This family tree, which includes four generations, is the first tree worked out in this country, and deserves further serious study.

In the discussion of Percy's paper, Bevan stated that there were many cases on record in which multiple ossifying enchondroma had caused a spinal cord lesion. Ochsner stated that when animals have these enchondromas, a large proportion of the offspring have the same form of tumors. M. L. Harris described a typical case with generally distributed tumors. There was a large growth about the lumbosacral junction with paraplegia. Operative removal did not relieve the paralysis. Bedsores and gangrene developed, and the patient died.

In 1915 I presented a review[1] of the subject based on the study of about 600 cases reported in over 300 articles, and the particular pathologic study of a section removed from an affected epiphysis in a growing child. I stated the belief that the disease was a distinct clinical entity, characterized by (1) the occurrence of multiple, more or less symmetric cartilaginous and osteocartilaginous growths within and on the skeletal system, generally benign, and resulting from a disturbance in the proliferation and ossification of the bone-forming cartilage; (2) the occurrence of certain typical distortions and deformities of the skeleton, and (3) the demonstration of inheritance in a large proportion of cases. To avoid the confusion which exists at the present time as the result of the multiplicity of terms by which the disease is known, I suggested the descriptive name of hereditary deform-

10. Withington, C. F.: A Case of Multiple Symmetrical Exostoses, Boston Med. and Surg. Jour., 1907, **156**, 200.
11. Oberndorf, C. P.: A Case of Multiple Exostoses Coupled with Syringomyelia, New York Med. Jour., 1910, **91**, 479.
12. Coon, C. E.: Dyschondroplasia, Am. Jour. Orthop. Surg., May, 1912.
13. Boggs, T. R.: Multiple Congenital Osteochondromata with Degeneration of Cranial Nerves and Muscular Dystrophy, Bull. Johns Hopkins Hosp., 1913, **24**, 210.
14. Vaughan, R. T.: Multiple Exostoses: A Hereditary Affection of the Bony Skeleton, Tr. Western Surg. Assn., St. Louis, 1913; abstr., THE JOURNAL A. M. A., Jan. 17, 1914, p. 231.
15. Carman, R. D., and Fisher, A. O.: Multiple Congenital Osteochondromata, Ann. Surg., 1915, **61**, 142.
16. Percy, N. M.: Multiple Chondro-Osteoma, Surg., Gynec. and Obst., 1915, **20**, 619.

ing chondrodysplasia. The review included a consideration of the terminology, occurrence and distribution, heredity, pathology, etiology, symptoms and complications, and treatment.

Ashhurst,[17] in 1916, reported a series of thirteen cases. Two had previously been reported by Dr. Davis, and two Dr. Ashhurst had not seen but reported from hospital records. The first patient was a girl, aged 4 years, with typical deformities, including subluxation of the right radial head. Case 2 was a man of 20 who presented ulnar deviation of the carpi. Case 3 was a negress of 11 who had a short left forearm and double pes valgus. Case 4 was a boy of 17, in whom the left knee showed outward bowing and relative increase in length. Cases 5 and 6 were two brothers of 15 and 13 years; a younger brother was said to be affected. Case 7 was a boy of 14, who had paralysis of the left ulnar nerve evidently due to pressure of the bony mass in the neck. In this boy the midpoint was half way between pubis and umbilicus. Case 8 was a man of 30, in whom the exostoses were first recognized a year before, following an attack of rheumatism. Dr. Davis in this case removed an exostosis of the left femur which was pressing on the sciatic nerve. Case 9 was a girl of 7; Cases 10 and 11 were the cases reported by Dr. Davis; Case 12 was a boy of 16, and Case 13 a man of 34.

Marshall,[18] in 1916, reported a case in a young woman. This patient will be described later (Case 10).[19]

PERSONAL CASES

CASE 1.—*History.*—Miss B. T., white, aged 11, entered the Children's Hospital, Nov. 6, 1914. She was born in Beverly, Mass. Father a French Canadian. Father, mother and six other children living and well. Detailed family history not obtained. She was an 8 months' baby, fourth child and very diminutive. Had breast milk for nine months followed by cow's milk and general table diet. She has always been a weak child. Began to walk at 19 months. Whooping cough the only disease of childhood. The deformity of forearm was first noticed at 6 months; it has become more and more prominent with time. The flatfoot has been noticed since the child began to walk.

Local: Patient stands with slight left dorsolumbar scoliosis, with both shoulders thrown forward, a mild degree of knock knee on each side, and the feet everted. She walks with a rather uncertain gait, throwing her weight on the inner side of the feet, especially on the right. The face is symmetrical, and shows no deformities. Motions at the right shoulder joint normal. The outline of the right elbow is distorted. The forearm can pronate, supinate, flex and extend normally, but the head of the radius is subluxed outward and is greatly increased in size over normal. Muscle power is good, however. Joint motions are free and there are no contractures. Both bones of the forearm are unusually short and to palpation feel thicker than normal. At the wrist, motions are free. There are no contractures and muscle power is good. The styloid process of the ulna is, however, at least 1 inch above the styloid of the radius and there is a distinct gap below the end of the ulna and the wrist joint. The lower ends of both bones are oversize and there is a slight inward bowing of the ulna at about its lower third. The left arm shows free motions at the shoulder, good muscle power and no contractures. At the elbow the outline of the joint is distorted. The head of the radius is subluxed externally and posteriorly, and is greatly increased in size. The motions of flexion and extension, pronation and supination are free, and there are no contractures. The forearm shows considerable bowing of both bones. At the wrist the ulna is short, the styloid process being at least 1 inch above the radial styloid; the lower ends of both ulna and radius are increased in size. Muscle power is good in all groups, and there are no contractures. The hands are rather small, and the fists cannot be more than half clenched, on account of the obstruction offered by the enlarged extremities of phalanges and metacarpals. At both hips the trochanters are on Nélaton's line, joint motions are free and muscle power good. At the knees muscle power is good. There are no contractures, and joint motions are free. At the right ankle the internal malleolus is unduly prominent and the whole foot is held everted; joint motions are free, and muscle power good in all groups. There are no contractures. The left ankle is held somewhat in the same position as the right. The internal malleolus is abnormally prominent. There are no contractures and muscle power is good in all groups. Reflexes: Knee jerks present on both sides. No clonus, Babinski, nor Oppenheim. Right arm: acromion to internal condyle 9⅛ inches. Left, 9¼ inches.

Left leg: length, 28⅛ inches. Circumference: thigh, 12¾ inches; calf, 8¾ inches.

Right leg: length, 28¼ inches. Circumference: thigh, 13 inches; calf 8¾ inches.

Roentgenologic Examination: Cranium negative; sella turcica of normal size. Thorax free, except for slight irregularities in lower ribs. Marked lateral curve in lumbar spine. Slight irregularities about sacro-iliac articulations. Both ilia show a peculiar series of radiating striations about the crests. Clavicles and scapulae are free, and the humeral heads show slight thickening. The lower third of the shafts of the humeri show some deviation from normal contour. The circumference is lessened, and the bone is bent. The humeral condyles show mottling. The ulnae are relatively short, bowed concave forward, and at the lower end present a large irregular bulbous enlargement, in which the epiphyseal line is lost. The radii are straight, with the upper end dislocated outward and upward, so as to form a marked projection at the level of the outer condyle. The lower end presents a similar irregular cystic-like enlargement, but the epiphysis is present intact, though relatively small. The entire carpal articulation is carried on the radius. The distal ends of all the metacarpals and the proximal ends of the first two rows of phalanges show the globular striated enlargements referred to. The femoral heads are squat and thick, with flat epiphyses and prominent trochanters. There is mild genu valgum in both legs, and the diaphyseal extremities of tibiae and fibulae are widened and irregularly striated; the fibulae are relatively short, so as to destroy the ankle mortise, and the tarsus is offset outward to create an extreme pes valgus. The heads of the metatarsals, and the proximal metaphyseal extremities of the first phalanges show the globular vacuolated enlargements already seen on the fingers. On the left foot the first and third digits show comparatively slight involvement, and are accordingly relatively longer than the other digits.

The deformities in this case consist in a scoliosis, shortening and bowing of the forearms, ulnar deviation of the hands, dislocation of the heads of the radii, moderate knock knee, extreme tarsal valgus, irregularity in length of toes, and shortness of stature. There are no exostoses, few hyperostoses, and the deformities are symmetrical.

The roentgenograms were taken at the Children's Hospital.

CASE 2.—*History.*—Miss J. W., white, aged 21, bookkeeper, was born in Boston of Jewish parents. The father was born in Hungary, a tailor, of ordinary height. He died of old age in Boston, at 82. His father died of tuberculosis. No knowledge of deformities in family. Mother born in Austria, living and well at 46, of ordinary height. Her father living, 82 years old. Mother died of old age at 75. No knowledge of deformities. One brother died of hydrocephalus at 1½ years. No other brothers or sisters. The patient had measles in childhood, and nervous indigestion for several years. Rheu-

17. Ashhurst, A. P. C.: Multiple Cartilaginous Exostoses (Hereditary Deforming Chondrodysplasia), with Notes of Nine Hitherto Unpublished Cases, Ann. Surg., 1915, **63**, 167.

18. Marshall, H. W.: A Case of Multiple Cartilaginous Exostoses, Am. Jour. Orthop. Surg., 1916, **14**, 346.

19. Since this paper was written, A. V. Moschcowitz (Ann. Surg., 1916, **63**, 749) has reported a typical case in a man of 31, in whom an osteochondrome of the left femur of considerable size projected into the popliteal space, producing cyanosis and coldness of the extremity through interference with the blood supply.

matic pains in joints whenever exposed to a draft, or at a change of weather, for years but never so as to be confined to bed. Menstruation at 14.

Physical Examination.—I first saw her, May 7, 1915. I found her a bright looking girl of excellent mentality. She had, in fact, won some distinction during her high school course. She had been working steadily as a bookkeeper during the past three years. The nausea had continued, but it was relieved by eating. She had had no benefit from treatment and was convinced that it was purely nervous. She had occasional twinges of pain in the joints. Wrists are weak, particularly the left, so that at times she can hardly lift a sheet of paper. She walks only with arch supports.

She is short in stature, measuring 4 feet 8½ inches. The middle point is half way between pubes and umbilicus. The arms are noticeably short, the right reaching a third way down the thigh, and the left being shorter still. Measurements from tip of acromion to the tip of middle finger are: right, 23½; left, 22¼. Musculature is good. Both arms hyperextend about 15 degrees at the elbow. Both wrists are loose in adduction, the left to a higher degree than the right, and just above the carpus the radius can be palpated on the inner as well as the outer aspect. Fists can be clenched tightly with the appearance of one or two small double knuckles. Wrists not greatly enlarged. Patient says that she formerly had a large mass on the ribs on the right side, but this disappeared four years ago, after she began to wear corsets. It is not to be felt now.

Moderate degree of knock knee. Large rough lumps to be felt above and below both knees. There are lumps and irregularities on the lower ends of both tibiae and fibulae. Slight degree of flatfoot, but on the whole the ankle mortise is well maintained.

Roentgenologic Examination: Cranium negative, normal sella turcica. Thorax shows a slight caving in of the ribs, especially on the left; enlargement of the costochondral junctions (rosary), and a tear-drop exostosis on the lower border of the fifth left rib, one third of the way around from behind. No scoliosis. Some irregularity about sacro-iliac articulations. Pelvis shows very wide ilia, and unusually thick pubes and ischia, with a relatively small superior strait. Clavicles thick, with enlargement at outer ends. Scapulae not remarkable. Upper ends of humeri show irregular enlargement of diaphyseal extremities, with longitudinal striation. About one third of the way down the shaft of the humerus on both arms is a moderate enlargement, from which project rounded stalactite exostoses. Elbow joints appear normal. The ulnae are relatively short. In a plate taken at the age of 6 the lower ends of the ulnae are irregularly enlarged, but do not reach to within an inch of the carpal articulation. The epiphysis cannot be distinguished. The lower ends of the radii are somewhat enlarged and irregular, particularly the right; the epiphyses are clear cut, but small. In the recent plates (taken at 18 years) the irregularities are much less, the bones showing a denser structure, with a straighter outline. There is no evidence of epiphyseal line. The right ulna ends in a point, which articulates laterally with the radius, and on the left it resembles a spear head. There is a fine retrodirected exostosis on the outer aspect of the lower end of both radii. The metacarpals and phalanges in the 6 year plate show irregular enlargement and vacuolation of the diaphyseal ends, most marked in the metacarpals. There is a spur on the left forefinger; the right middle finger is disproportionately long, and the distal phalanx subluxed inward. The later plate shows the same conditions except that the bone is denser and the outlines less irregular, and the epiphyses have disappeared in moderate globular striated enlargements at the ends of the bones. At the hips, the femoral necks are short, and very much increased in width; the outlines are irregular and the trochanters prominent. The shafts are of normal contour down to the lower ends, which are squared, striated longitudinally, and present hooklike exostoses, directed upward. The same lengthening and squaring of the diaphyseal extremity is apparent in the upper end of the tibiae, but here the pair of stalactite exostoses are directed downward. The upper ends of the fibulae show marked irregular globular enlargement, cystic in appearance, much larger on the left. There is moderate genu valgum. The shafts of fibulae and tibiae are clear. Their lower ends are broadened, and there is a long irregular pseudarthrosis between them. The fibulae are relatively short, but the axis of motion of the ankle joint is not disturbed. In none of the late plates is there evidence of an epiphysis.

The deformities in this case consist in disproportionate shortness of stature, deformity of thorax, rosary, shortening and bowing of forearms, ulnar deviation of the hands, subluxation and asymmetry of fingers, moderate genu valgum, moderate pes valgus, enlargement of the diaphyseal extremities at shoulder, knee and ankle, a few exostoses, and a chondromatous enlargement of the upper end of the fibula. The occurrence is symmetrical, although the degree varies slightly.

The early plate was taken at the Children's Hospital, the later plates at the Boston City Hospital.

CASE 3.—*History.*—Mr. F. R. J., aged 56, white, janitor, first seen May 11, 1915, in the orthopedic outpatient department of the Massachusetts General Hospital, by courtesy of Drs. Brackett and Low, was born in Vermont, of American parents. Father died in 1910 at 82, mother died in 1915 at 87. Family short in stature. Father and mother both of same height as patient. One sister died in infancy. One brother living and well, of normal height. Grandparents American born. No history of deformities or exostoses.

The patient had measles and pertussis as a child. Denies venereal diseases; does not use alcohol. At 7 or 8 years outgrowths and deformities were first noticed. Taken to local physician who said that patient had exostoses and would probably be a cripple. At 14 an extensive crop appeared, growing "as fast as he grew," some being painful or tender at times. Went under treatment with a "quack" doctor for three years; he stopped the pain and stopped the bunches from increasing in size. Since then he has had no new bunches, no increase in size, no disappearances.

Had occasional growing pains or rheumatism when young; at 19 inflammatory rheumatism, in bed one week.

Has always been able to do heavy work; when younger could run upstairs with a bag of corn over his back. No trouble with walking. No bunch is large enough to interfere with the free action of any joint.

Physical Examination.—The patient is a genial, intelligent-looking American. Height 5 feet, 2 inches. Middle point is 3 inches above pubes. Finger tips reach to point short of midthigh.

Upper arms not remarkable. Lower arm short and curved. No dislocation of radial head. No club hand, although entire articulation is carried on radius. Hand is stubby, no limitation in closure, but both fourth fingers are short, the same length as little fingers.

Stands with considerable knok knee, greater on the right, approximating 45 degrees. The right knee, probably in part as the result of the injury already noted, allows of lateral mobility of about 20 degrees. Both knees very large, with palpable exostoses. Lower legs: fibulae short, with dislocation valgus, more marked on right. No limitation of motion at knee or ankle. Good function knees and ankles, except at right knee, as noted.

Roentgenologic Examination: I have plates only of the arms and legs. The shoulders show the characteristic striated elongation of the upper end of the humerus. The ulnae are short, curved, and articulate with the inner surface of the radius. The lower ends of ulna and radius are irregularly enlarged, and of thinner texture than the shafts. The knees show marked valgus, elongation and squaring of the diaphyseal ends, with irregular exostoses at the corners, projecting upward on the femur and downward on the tibia. The upper ends of the fibula are enlarged and thinned, and run by direct fusion into the tibiae. The lower ends of the tibia and fibula are distorted; on the right there is fusion of the two bones. On the left there is a pseudarthrosis. The fibulae are short; there is a fair ankle mortise, but the axis of motion of the astragalus is oblique, rather than horizontal.

The deformities in this case are disproportionate shortness of stature, shortening and curvation of forearms, mild ulnar

deviation of the hands, shortness and asymmetry of fingers, knock knee, pes valgus, hyperostoses and exostoses about joints. The deformities are symmetrical.

The plates were taken at the Boston City Hospital.[20]

Case 4.—*History.*—Mrs. E. H. H., aged 20, white, first seen, May 25, 1915, at her home in Somerville, through the courtesy of Drs. Binney and Kimpton, was born in Montreal, Canada. Father was an Englishman, from Sussex. He was about 5 feet 8 inches in height, and is not known to have had any deformity. He died in 1910 at 48. Mother was a French Canadian, born in Montreal, of normal height, and is not known to have had any deformity. She died in 1915 at the Boston City Hospital. The family consisted of eleven children, three boys and eight girls, of whom the patient is the fifth. One boy and one girl died in infancy. The others are living and well, and are said to present no deformity. This patient is the only one who is distinctly below normal height.

Physical Examination.—Patient is 5 feet 5½ inches in height. Middle point is just above pubes. The right arm is 25 inches and the left arm is 24¾ inches. The outer ends of the clavicles are rough, and on the right there is a sharp knob. The forearms are short, somewhat curved, right, and sharp curve left. Wrists enlarged, but no disability. Can close fists. Middle fingers long.

Moderate knock knee; some pes valgus, but feet seem good from point of view of function. Ankles enlarged. Large knob on the outer side of femur above the left knee.

Roentgenologic Examination: Cranium negative; sella turcica normal in size. Thorax shows a very pronounced caving in of the ribs on both sides. There is an irregular enlargement of several of the ribs, particularly the first four on the left and the first two on the right. There is a synostosis between the third and fourth, left. The spine shows a double scoliosis. The sacro-iliac joint and pelvis are clear. The clavicles are thick and enlarged at both extremities. The scapulae show small irregularities; upper end of humeri show small united epiphyses. On the left the contour is normal, but there are several fine exostoses, and on the right the shaft near the upper end shows irregular cystic enlargement with small exostoses. The lower halves of the shaft are free, and the elbow joint is normal. The forearms are short with a very marked relative shortening of the ulnae. The radius is curved and its lower end irregularly enlarged. There is no epiphyseal line apparent. The articular surface of the radius stands at an obliquity of about 45 degrees to the shaft, making a potential manus vara, with a very weak wrist. The fingers show globular enlargement at the metacarpophalangeal articulations and the first interphalangeal articulations particularly. The middle fingers of both hands are relatively long. The upper ends of the femur are thick, with short, thickened necks. The shafts are free down to the lower diaphyseal extremities, which are square, elongated, striated longitudinally and present several exostoses, directed upward. The upper diaphyseal extremities of the tibia and fibula are similarly squared and elongated and present exostoses directed downward. The lower diaphyseal extremities are elongated and present pseudarthroses. The ulnae are relatively short, and the tarsi are in valgus.

The deformities in this case are disproportionate shortness of stature, scoliosis, deformity of thorax and ribs, shortness and curvation of the forearms, ulnar deviation of the hands, knock knee, pes valgus, asymmetry of fingers, and hyperostoses and exostoses about joints. The deformities are symmetrical. There is no evidence of epiphyseal line, except at the upper ends of the humeri.

The plates were taken at the Boston City Hospital.

Case 9.—*History.*—E. L., boy, aged 12, white, seen May 22, 1916, at my office, was born in Cambridge, Mass., of Anglo-American parents. Father well at the age of 42, height 5 feet 6 inches, printer, born in Rockland, Maine. He has three brothers and one sister all below medium height, except the oldest. The oldest has one child. His father died of paralysis in the fifties, and his mother is living and well, in the sixties. No history of deformity.

Mother living and well at the age of 48; born in Rockland, Maine; 5 feet 6 inches in height. Her father was a sea captain, above medium height. He wore a corset for some "spinal trouble," and died in 1885 of Bright's disease at 53. Her mother was a delicate woman who died at 52 in 1890 of gastric cancer. She was above medium height. Her one sister is living and well. No history of deformity. She was married at the age of 17. No miscarriages, has lost no children. One other child beside patient, a girl of 15, living and well, without deformity.

Roentgenologic Examination.—I have plates of the arm and knees of this patient at the age of 8, and plates of the entire skeleton taken at the present age of 12. The thorax shows no abnormality, spine slight scoliosis. Pelvis shows marked irregularity about the epiphyses as well as considerable thickening of bone. Clavicles show marked thickening of the inner ends, particularly on the right. The scapulae show small spurs and irregularities, particularly about the head and neck. The humeri are somewhat thickened and dense at the upper ends, with wavy outline, and the epiphyses are partly united. Elbows: some irregularity in bony structure and in outline about condyle of humerus. The epiphyses are distorted in the early plate and show signs of partial union in the more recent picture. The ulna on the left is markedly shortened and somewhat curved. It ends in a point, which does not take part in the carpal articulation. This point is capped by a small triangular epiphysis. The radius is curved and thickened at the lower end, and the epiphysis is distorted. The right forearm presents a practically straight ulna with slight irregularity in outline at the lower end, and a small epiphysis not united. The radius is slightly curved; both epiphyses show partial union. The fingers show striation at the metaphyseal ends, with slight disproportionate lengthening of the right middle finger. The hips present marked thickening of the neck with irregular contour in the region of the lesser trochanter and partial union of the epiphysis. The knees show squaring of the metaphyseal ends with striation and spur formation at the corners, a process which is carried further in the more recent plate, the striated portion extending further up on the shaft and the spurs being increased in size. There is slight knock knee, and the more recent plates show a partial union of the epiphysis. The upper ends of the fibulae are vacuolated and the lower ends are irregular and vacuolated, and in contact with an irregular surface on the outer side of the tibia. The shafts of tibiae and fibulae are clean cut. The fibulae are relatively short. The feet show calcaneal spurs and striation and irregularity of outline at the metaphyseal extremities of metatarsals, and to a less degree on the phalanges.

The deformities in this case are as follows: moderate valgus at the left elbow, shortening and curvation of the forearm, greater on the left, ulnar deviation of the wrists, particularly the left, small hands with asymmetry in length of fingers on the right, moderate genu valgum, moderate pes valgus, disproportionate shortness in stature, and juxta-epiphyseal hyperostoses and exostoses.

The plates were made at the Children's Hospital.

GENERAL OBSERVATIONS

I have found in the American literature fourteen articles on this disease and four recorded case reports, the earliest dated 1875. The inevitable deduction seems to be that the condition is a rare one in this country. The cases formally reported in these records number twenty-nine; but if the cases mentioned in discussion are added, as well as the relatives stated as being affected, the total is brought up to seventy-one. Some of these, however, were not residents of the United States.

But in comparison with these figures I can say that in a period of about a year in Boston I have unearthed

20. September 26, this patient, employed as an elevator man in a Boston hotel, suffered a severe crushing injury of his right leg above the ankle. I performed an amputation, from which he is recovering uneventfully. The specimen is being studied at the pathologic laboratory of the Harvard Medical School.

the series of twelve cases herewith presented, and a few months ago Ashhurst reported a series of thirteen cases from Philadelphia. Accordingly, it is easy to believe that with more widespread knowledge of the condition, an interested search will bring to light many cases in other communities, and raise the disease out of the ranks of uninteresting rarities.

As to the sex occurrence, adding my cases to the seventy-one mentioned above, there are seventy-three in which the sex is given. Of these fifty-five are male and eighteen female, just about in the proportion of 3:1. This agrees with the figures which I stated in my previous article.

The question of nationality is interesting, but it is a complicated one to work out in this country, where so many racial stocks are involved. Many authors make no statement whatsoever on this point. Dr. Percy's family of twenty-six patients were of Dutch birth or descent; five others are given as being of German birth or descent, and there were two of Irish, and one each of Italian, Austrian, English, and French-Canadian birth or race. One had an English father and French-Canadian mother. The Austrian was a Jewess, and is one of the very few reported. The negress reported by Dr. Ashhurst is the only one I have found in the literature, although the disease is known to affect others than Caucasians. Of the remaining forty-five, some are stated as being native-born of Anglo-American stock, and the rest were probably for the most part of the same origin. I previously stated that the German cases predominated in the literature (60 per cent.); next followed the French (27 per cent.) and English (8 per cent.). All other countries together showed only 5 per cent. This American series is interesting for the predominance of Anglo-Americans, and the occurrence in a negress and a Jewess.

Heredity has been a hard matter to study in connection with the disease, because the country is young and the population mixed and to a large degree migratory. Many of the case reports have been casual, and make no mention of this subject. It happens that we now have several families authoritatively worked out in this country. The largest is that of Percy, with twenty-six affected in four generations; then comes Gibney's with four in two generations, mine with three in two generations, Boggs with father and son, and Ashhurst with two, and probably three, brothers. In addition there have been reported in discussion a girl with two brothers and probable father (Taylor); a brother and sister, with mother, grandmother, and great-grandmother (Ashley), and three generations (Freiburg). Accepting these, we may say that inheritance or familial occurrence was shown in fifty cases. In the remaining thirty-two, it is stated in twelve that no evidence of heredity was obtained.

The characteristics of the disease in the cases here reported have agreed well with my previous description of the disease. The affection is distinctly one of the period of skeletal growth. It has been usually first noticed in infancy or early childhood; the manifestations have increased with skeletal growth, and ceased at skeletal maturity. Chondromatous tumors may increase rapidly in size, and regress, either before or after maturity; but the bony spurs, usually capped with cartilage, grow slowly and are undoubtedly fixed at skeletal maturity. They may fracture, and the fractured portion absorb, or the bursa which frequently covers them may become inflamed from irritation, and form an abscess or subside, or a spur may become infected and carious. It is unlikely that the bony elements regress in adults, although Davis records a case in which this apparently occurred under his observation in a man of 53.

Disproportionate shortness of stature was constant in the seven of my cases in which it was measured for, and Ashhurst reports it as a finding in one case. I believe that it will be found practically constant in well marked examples of the disease. Generally, the cases have shown irregular juxta-epiphyseal hyperostoses, particularly marked at knee, hip, shoulder, ankle and wrist. The lower end of the femur and the upper end of the tibia have shown a characteristic squaring-off, with spurs at the corners, running upward from the femur, and downward from the tibia. These spurs should not be confused with the developmental exostoses about the knee, which are similar, but are purely local, and bear no definite relationship to this disease. These spurs may increase in size and change their shape in the period of growth. The enlargements at the metaphyseal ends increase in length with skeletal growth; in the younger patients they are thin in density, and striated or mottled in appearance; the older cases are striated longitudinally, and are dense in structure, with heavy more or less wavy outline.

The lower end of the ulna, occasionally of the radius, and both ends of the fibula characteristically show a thin bubble-like vacuolation, suggesting cysts. The bone becomes denser and the outline more regular in the older patients. In the majority of cases the ulna and fibula are disproportionately short in relation to the radius or tibia. The ulna is likely to end in a point, articulating with the radius on its mesial aspect, but not partaking in the carpal articulation. This gives rise to a club hand, or a weak wrist with ulnar deviation (potential manu vara). The relatively excessive length of the radius is also taken up in a bowing of the shaft, sometimes with a dislocation upward of its head, and rarely in a spiral twist about the ulna (case of Carman and Fisher). The relative shortening of the fibula disturbs the mortise at the ankle joint, and causes a structural valgus. The tibia is a strong bone, with its ends firmly set into joints, and it does not become distorted from the shortness of its companion, as does the radius. The fibula frequently becomes structurally united with the tibia at one or both extremities; sometimes, instead, there is a long irregular pseudarthrosis, particularly at the lower end.

The fingers and toes show the same type of bulbous juxta-epiphyseal enlargement, vacuolated in the younger patients, becoming denser and more regular in outline later. In marked cases these form double knuckles, and prevent complete closure of the fist. Frequently fingers or toes are irregular as to length, one being longer or shorter than it should proportionately be. There seems to be demonstrable correspondence between the amount of bony involvement and the extent of retardation in growth. Generally, the hands are small and chubby. Fingers may be crooked or a phalanx subluxed, from an irregular growth.

The cranium is generally not involved, although in one case a spur on the left superior curved line of the occiput is cited (Ochsner and Rothstein). There may be growths on the jaw, or the mastoids and other prominences may be roughened and enlarged. One case in this series was diagnosed as exostosis in the sella turcica, and Virchow found at necropsy that the occur-

rence of small spurs on the basilar process at the spheno-occipital junction was common. The spine frequently shows a lateral curve, and occasionally spurs on the bodies or spinous process are demonstrable by roentgenoscopy. Clavicles and scapulae frequently show spurs, thickening, or irregularities in outline, which, if subcutaneous, may cause ulceration of the skin. The ribs often show enlargement at the costochondral junction (rosary), occasionally a spur, or a broadening of and synostosis between ribs. There may be irregularities about the head and neck of the ribs, and occasionally the thorax shows a marked caving in of both sides.

Growths at the lumbosacral junction and about the sacro-iliac joint are frequently demonstrable. The pelvic bones are likely to be thickened, lessening the diameter of the superior strait; the crest may show striation, or there may be spurs on or within the crest. The upper end of the femur is enlarged and irregular, and the neck is short and thick. This may rarely interfere with function. Knock knee in mild degree is common, and in excessive degree not unusual.

Pediculated osteochondroma may arise from any affected portion of the skeleton, particularly from the juxta-epiphyseal hyperostoses. They may grow rapidly in size, even after the cessation of skeletal growth. The shafts of the long bones are likely to be free from irregularities or spurs, these grouping themselves at the metaphyseal ends. It may be said categorically that the bony irregularities mark the progress of a disturbed or pathologic ossification at the epiphyseal line. The epiphyses of the bones most affected usually show some distortion in the roentgenogram, and at the wrist this may be very marked. The union of the epiphysis with the shaft occurs abnormally early, as a rule.

The skeletal disturbances and malformations are generally speaking symmetrical for the two sides of the body. Usually minor differences may be apparent, in degree of distortion, but it is rare to have any one side suffer a great deal and the other be only slightly affected. This occurred, however, in one case, that described by Coon. This patient resembles those of the small series discussed by Ollier, Wittek and Frangenheim, and in several other ways he departs from the rule. I consider this case, however, to come within my definition of the disease.

This series has brought out several cases representing the rarer complications of the affection. Freiburg, in the discussion of Davis' paper, reported a case of popliteal aneurysm caused by friction of a bony spur against the artery. There are only seven other cases of this sort on record.

Nerve complications have been unusually frequent. These include a case with syringomyelia and acromegalic symptoms, probably from a spur in the sella turcica (Oberndorf); cord symptoms from a pediculated intraspinal osteoma (Ochsner and Rothstein) and from a growth at the lumbosacral junction (Harris), both operated on; and peripheral manifestations, (1) in the ulnar nerve from pressure by a bony mass in the neck, and (2) in the sciatic from pressure of an exostosis (Ashhurst). The case of Boggs' had degeneration of the acoustic and optic nerves, muscular dystrophy and thyroid atrophy.

There have been in this series no cases of secondary malignant chondroma. In my previous paper I stated that this occurred in about 5 per cent. of the reported cases.

CONCLUSIONS

Hereditary deforming chondrodysplasia can no longer be considered a rare affection in this country. The disease is a distinct clinical entity, whose manifestations are now well defined. The work which has been done on its pathology points definitely to a disturbance in the bone-forming cartilage as the underlying cause. The hereditary nature of the disorder, which has been pretty well demonstrated, gives it an individuality which makes investigation interesting. The disease should be given wider recognition and study, not only for its importance, but also because it opens up the whole field of obscure congenital skeletal affections.

ABSTRACT OF DISCUSSION

DR. ALBERT H. FREIBERG, Cincinnati: No one can discuss this subject to any great extent because so little is known of the true nature of this condition. I can simply tell you the circumstances under which I saw a case very early in my surgical career, when, as assistant to a general surgeon, we operated on a popliteal aneurysm which was produced by fracture of the pedicle of one of these exostoses in the popliteal space. The case was similar in all respects to the cases Dr. Ehrenfried has shown us; and there was a very distinct history of transmission through the male side of the family for a number of generations.

DR. ALBERT EHRENFRIED, Boston: This disease is not a rarity. I have found seventy-one cases recorded in this country, most of them in the past few years. Ashhurst has just reported thirteen cases from Philadelphia, and the twelve in my series were collected in Boston in less than eighteen months, so it cannot be very uncommon. The disease is a distinct clinical entity. Exostoses play a very small rôle; they were considered characteristic in the days when we had to depend on palpation for diagnosis, but now the Roentgen ray shows the whole bony picture. The pathology of the affection has been cleared up to a considerable degree. My own work has demonstrated a dysplasia of the intermediary cartilage as a basic element in the disease and the chief source of the skeletal deformities, and has corroborated the persistence of islands of cartilage as the probable source of the hyperostoses and osteochondromas. The matter of heredity I have just touched on. It is a fascinating subject, and when thoroughly worked out will undoubtedly assist us to a proper understanding of the whole group of congenital skeletal affections of which we now know so little.

Artificial Milk.—Vice Consul Hamilton C. Claiborne, at Bradford, England (*Commerce Reports*, Jan. 11, 1917) reports that application has been made for a patent on the process of making an artificial milk from peanuts, soya beans, sugar, water and mineral salts, which is said to be wholesome and inexpensive. The method of making the milk, as taken from the Yorkshire *Observer*, is as follows: In 200 pints of pure water at 80 C. are dissolved 400 grains of potassium phosphate, or the equivalent amount of sodium phosphate; sufficient sugar is added to give 4.5 per cent. to the finished milk, and 40 pounds of meal prepared from one of the above nuts, blanched. The solution is boiled in a steam-jacketed pan, then subjected to the operation of a vacuum pan, and finally treated with a culture of lactic bacteria until the required acidity is obtained. It is afterward pasteurized at 60 and 70 C. for at least twenty minutes, cooled and stirred, while 0.05 to 0.11 per cent. of citric acid is added. The milk so produced is said to be condensed and sold in tins or dried to a powder and sold in bottles. It may be given a certain percentage of cream, it is said, by the addition of coconut or one of the other tasteless nut fats, the fat being added when in the vacuum pan. It may be cultured by the addition of lactic bacteria to give a table cream or a soured mass for making into cheese.

COMPRESSION PARALYSIS OF POTT'S DISEASE IN ADULTS*

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In reviewing my own experience relative to compression paralysis of Pott's disease in adults, I have been impressed by the frequency of its occurrence, of the severity of the symptoms, and the mortality. The general picture of Pott's paraplegia in adults, compared with that usually seen in children, justifies a discussion of the problem which is distinctive in many regards. To approach this subject it is necessary to quote data not only obtained from the records of my own service, but also from other services at Cook County Hospital.

In seventy-five cases of adult Pott's disease, examined and treated at this hospital from January, 1914, to May, 1916, between the ages of 19 and 62 years, paraplegia occurred in twenty-four cases, and of these the known number of deaths was sixteen. The termination in the remaining eight cases is unknown. Surgical procedure, such as osteoplasty or laminectomy, was performed in thirteen of the twenty-four cases at some period in the course of Pott's disease. Postmortems were held in seven cases, of which five had compression paralysis.

Unfortunately a full analysis of my series of cases of Pott's disease is impossible on account of the incomplete records of the cases; nevertheless, they warrant a definite opinion that pressure paralysis of the cord is relatively frequent in adults. That this complication of Pott's disease should be of frequent occurrence ought not to be surprising, considering the immediate proximity of the cord to the site of the disease.

There are two factors to be considered in compression of the spinal cord in tuberculous spine disease: first, pressure from tuberculous granulation tissue which occurs mostly in children, and second, pressure from intraspinal abscess, usually seen in adults. Though other factors have been prominently mentioned, such as alteration in the position of the vertebrae, producing an angled projection of the spinous process, and protruding sequestrums at the site of the kyphos as a sequence of vertebral destruction, they should not be seriously considered. As to the angled projection, the caliber of the spinal cord is not narrowed in the anterior-posterior direction, as is generally supposed, and sequestrums are improbable.

In adults, compression of the spinal cord and nerve roots is most frequently the result of intraspinal abscess, although occasionally due entirely to granulation tissue. It is not exceeding the limit of probability to state not only that intraspinal abscess leads to paralysis, but also that the pressure will usually be protracted and tend to produce severe injury to the cord. Eventually the abscess may make its way out of the spinal canal into the deep tissues, though without corresponding relief of the symptoms. In exceptional cases, however, the paralytic symptoms may disappear if the pressure has existed only for a short time and has been relieved by the migration of the abscess outside of the vertebral canal.

Intraspinal abscesses are interpreted in roentgenograms as irregular, dark, wavy shadows surrounding apparently destroyed vertebrae. On the roentgenograms of patients with tuberculous spines, available for examination, intraspinal abscesses were observed in eighteen. Of this number fifteen had clinical symptoms of compression paralysis; whether or not the other three cases developed paralysis is unknown. In two paralytic patients with no characteristic symptoms of tuberculous spine disease and in which the roentgenograms did not show either vertebral bone destruction or shadows indicating abscess formation, the diagnosis of Pott's disease with intraspinal abscess was made only after postmortem examination. Five paraplegic patients went to postmortem, and intraspinal abscesses were found in all.

In children the majority of cases of Pott's paraplegia are due to pressure from inflammatory changes in the dura mater, the result of extension of the tuberculous process into the vertebral canal. This produces a disturbance of function without setting up a destructive or degenerative process. Only occasionally does an intraspinal abscess occur. These observations are based on (1) the examination of roentgenograms of tuberculous spines in children, which seldom show shadows indicating intraspinal abscesses, and (2) the fact that children afflicted with Pott's paraplegia when treated by recumbency on a Bradford frame, with or without traction, generally recover.

That recumbency can influence ultimate recovery in Pott's paraplegia where there has been severe and protracted pressure with consequent injury to the cord is improbable. In my opinion, restoration of function following recumbency ensues only when the stress has been moderate, as from tuberculous granulation tissue. Therefore, when recovery follows compression paralysis of Pott's disease, either in children or in adults, the lesion must generally be considered as having been a tuberculous granulation tissue rather than an intraspinal abscess. Of the twenty-four patients afflicted with Pott's paraplegia, due to intraspinal abscess, not one complete recovery has been recorded; generally death has resulted; but in those cases which, perchance, have not proved fatal, the degenerative changes in the cord were so great that a permanent paralysis remains. However, one patient (Case 3) partially recovered.

The treatment of so persistent an affection as Pott's paraplegia, the result of intraspinal abscess, has been without favorable effect. In the routine treatment of Pott's disease, I have operated both by the method of Albee and Hibbs, but neither has made any noticeable impression on the paralysis. Laminectomy, too, has been tried without securing results. In fact, where laminectomy was performed on four patients, death followed within a short period.

Postmortem examination in the five patients previously mentioned revealed total destruction of one or more vertebrae with abscess formation. The abscess communicated through the space formerly occupied by the destroyed bodies of the vertebrae, compressing the spinal cord. The dura mater was enormously thickened, markedly infiltrated and covered by yellowish, caseous material and occasionally by soft granulation tissue masses; the inner surface was smooth. The spinal cord was hyperemic in the region of the compression, and was completely severed in three cases.

* Read before the Section on Orthopedic Surgery at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

In one case it was compressed from side to side. Pulmonary tuberculosis was the primary cause of death in four cases.

The following cases are selected to substantiate my observations of compression paralysis of Pott's disease, and also to introduce phases of the subject not hitherto discussed in the text of this paper:

REPORT OF CASES

CASE 1.—W. C., man, aged 56 years, admitted to the medical service of Cook County Hospital, June 24, 1914, complained chiefly of pain in the left side of the chest for the past two weeks, and during this time cough developed which gradually grew worse.

The lungs gave a distinct friction rub in the left side, and a few râles could be heard. Tubercle bacilli were found in great numbers; reflexes were normal.

Aug. 7, 1914, the patient complained of a beginning weakness in the legs. Three weeks later he could not walk without support. At this time he had a steppage gait, exaggerated knee jerks and ankle clonus on the left side. No deformity of the spine nor typical symptoms of Pott's disease were present. Roentgenograms showed destructive lesion of the third, fourth and fifth dorsal vertebrae and a shadow denoting abscess formation.

Sept. 14, 1914, he complained of pain in both legs. The knee jerks were markedly exaggerated; Babinski was present and there was incontinence of urine, etc. He was transferred to the orthopedic department, and from there referred back to the ward for pulmonary tuberculosis, because he was not considered an orthopedic case.

He died, Oct. 11, 1914, and a necropsy showed caseous tuberculosis of the tracheobronchial lymph nodes; apical pulmonary tuberculosis; necrosis of the fifth and sixth dorsal vertebrae and a tuberculous abscess communicating through these vertebrae, pressing on the dura mater. Microscopic examination of the spinal cord was not made.

CASE 2.—H. H., man, aged 22, entered the neurologic department of Cook County Hospital, Jan. 18, 1915, complaining of pain, numbness, heaviness and stiffness in both lower extremities, and also difficulty in walking. Seven years previous he had tuberculosis of the cervical region of the spine, but he has been without any discomfort up to one year ago, when the foregoing symptoms appeared.

Muscle power is good in the upper extremities, but decreased in the lower; both lower extremities are spastic, the right more than the left; tendon reflexes markedly exaggerated; Babinski is present and ankle clonus increased. There is a small kyphos in the region of the eleventh dorsal vertebra.

Roentgenograms show bone destruction of the lower dorsal and first lumbar vertebrae, but no apparent shadow indicating abscess formation.

The diagnosis is compression myelitis of Pott's disease.

Feb. 20, 1916, laminectomy was performed, and the patient died about two weeks later. No postmortem was held.

CASE 3.—M. S., man, aged 20, admitted to my service at Cook County Hospital, May 31, 1915, as a transfer from the tuberculosis ward, stated that he had been coughing more or less for about one year. Six months ago he became aware of a small deformity in the dorsal region of the spine which had increased in size. He suffered no particular discomfort other than the inability to bend the spine freely. In the past four months he noticed a gradual difficulty in walking—a sense of heaviness and stiffness in the legs.

The gait is slow, with a stiffness and dragging of the feet; tendon reflexes are exaggerated; there is loss of muscular power, and loss of cremasteric and abdominal reflexes; Babinski is present and ankle clonus increased. There is a small kyphos at about the seventh to the ninth dorsal vertebrae, and impaired resonance of the left upper lobe and the right lower lobe, together with a few subcrepitant râles.

Roentgenograms show collapsed bodies of the eighth and ninth dorsal vertebrae and a very classical shadow around the seventh to the tenth dorsal vertebrae indicating cold abscess.

The diagnosis is tuberculous spine with beginning paraplegia and incipient pulmonary tuberculosis.

June 15, 1915, the Albee operation was performed.

Dec. 1, 1916, the condition on discharge to Oak Forest Infirmary was about the same as mentioned above.

June 6, 1916, the patient returned to Cook County Hospital for examination. He walked with a quick, firm step; the tendon reflexes were markedly exaggerated; Babinski was present and ankle clonus increased.

Roentgenograms showed a shadow surrounding the seventh to the tenth dorsal vertebrae indicating a cold abscess.

CASE 4.—M. M., woman, aged 31 years, admitted to Cook County Hospital, April 23, 1915, complained of parasthesia in legs and feet; she was unable to use the lower extremities, and also there was incontinence of urine and feces. The paraplegia began eight months before with sensation of tingling, numbness and a "dead feeling" which steadily increased. Previous to this time she had been well.

There was complete paralysis in the lower limbs, spastic in type. All reflexes were exaggerated and Babinski positive on both sides. Sensory disturbances were limited to the lower half of the body up to the region of the umbilicus, running in a circular line around the body; there was kyphos in the region of the third and fourth vertebrae. Bladder and rectal disturbances were marked. There were trophic sacral bedsores.

Roentgenograms showed marked bone degeneration involving the fourth to the twelfth dorsal vertebrae and also a very definite shadow opposite the fourth to the eighth dorsal vertebrae, indicating cold abscess.

The diagnosis was tuberculous spine disease with paraplegia.

Patient died, May 22, 1915, and necropsy revealed a cold abscess the size of the fist in the region of the third to the fifth dorsal vertebrae projecting anteriorly into the chest cavity. The sac of the abscess was thick and on opening a cheesy, yellow tuberculous pus exuded. The bodies of the third, fourth, fifth and sixth vertebrae were destroyed, through which the abscess sac compressed the spinal cord to the extent of almost complete severance. The dura mater was markedly infiltrated—a peripachymeningitis—in the region opposite the lower part of the cord and cauda equina. The spinal cord was curved on itself in the upper dorsal region. Microscopically the gray matter was broken up in separate patches irregularly scattered over the surface, so-called heterotopic changes, which are considered to be artificial. Above and below the focus of softening there were found ascending and descending degeneration. In the posterior and lateral columns were circumscribed foci of softening surrounded by some glia tissue.

CASE 5.—E. K., man, aged 22, entered the neurologic service of Cook County Hospital, June 15, 1915, with the following history: About two weeks previous he became aware of a difficulty in getting out of bed; for the next three or four days he could manage to get up and around to a slight extent, but if he tried to move fast he would fall. At the present time he is unable to walk and has slight pains in the shoulder and back. Otherwise the history is negative.

In the left supraclavicular space and just in front of the right trapezius muscle, apparently connected with it, is a soft, painless, freely movable tumor about the size of a small hen's egg; patient states that this tumor appeared about five days previous to his inability to walk. On the left pectoralis major muscle, near its origin, is a soft, distinct, painless tumor extending from the second to the fifth rib the size of a man's palm, which has been present for about two months. No fluctuation is obtainable. Below this tumor is a small, painless, fluctuating one about 1½ inches in diameter from which a brownish, yellowish fluid was aspirated. The tendon reflexes and exaggerated Babinski, Gordon and Oppenheim are present. Anesthesia is complete in the lower limbs up to the level of the eleventh dorsal vertebra; from the seventh to the eleventh dorsal vertebrae there is hypesthesia; pain, heat and cold touch are lost in this region; there is apparent lack of control of the sphincter muscles. There is deformity of the spine.

The luetin test proved negative. The Wassermann blood test was positive, while the Wassermann spinal fluid test, made ten days later, proved negative. Roentgenograms showed no destructive changes in the vertebrae nor a shadow indicating abscess formation.

The diagnosis of myelitis (traumatic or compression) was made.

The patient finally died, Dec. 3, 1915. Necropsy showed miliary tuberculosis of both lungs; fibrocaseous tuberculosis of the tracheobronchial lymph glands, and fatty degeneration and passive hyperemia of the liver. A tuberculous abscess, about 4 cm. in diameter, was bulging from the fifth and sixth dorsal vertebrae, the bodies of which were completely destroyed. On opening the vertebral canal there was a tuberculous, cheesy mass surrounding the dura mater opposite the fifth and sixth dorsal vertebrae. The dura mater over the dorsal and lumbar region was found enormously thickened and covered with caseous and soft granulation tissue masses. On opening the dura mater, the inner surface was smooth, but hyperemic; the cord too was hyperemic. Microscopically the lower cervical region of the cord showed a patch of softening occupying the posterior horns and part of the posterior columns. The axons were found swollen and broken up in small fragments, while the hyalin was in the form of lumps, drops or droplets. The glia showed the so-called ameboid transformation. In addition there were present the usual findings of ascending and descending degeneration.

CASE 6.—M. O., woman, aged 25 years, entered my service at Cook County Hospital, July 3, 1915, as a transfer from the neurologic service. Six months before she complained of pain in the abdomen followed by numbness and tingling in both legs. One month later she lost complete power in the lower limbs. About two months afterward an operation (laminectomy) was performed.

Both legs lie extended and immobile; patellar reflexes, ankle clonus and Babinski are absent. There is a scar over the region of the middle and dorsal vertebrae as from recent operation. There is no apparent kyphos. Sitting up increases the pain referred to the abdomen. There is incontinence of urine; there are trophic ulcers over the sacrum and some dry rales over the right chest anteriorly.

Roentgenograms show destruction of the tenth and eleventh dorsal vertebrae, and also a very definite shadow in the region of the seventh to the eleventh dorsal vertebrae indicating cold abscess.

The Wassermann test was negative.

The diagnosis was tuberculosis of the spine with paraplegia and pulmonary tuberculosis.

Necropsy revealed a cold abscess about the size of a lemon along the ventral aspect of the dorsal vertebrae and communicating through the space formerly occupied by the bodies of the tenth, eleventh and twelfth vertebrae, which were completely destroyed. The anterior and lateral portion of the seventh and eighth dorsal vertebrae were roughened. The dura mater was thickened and covered by cheesy material; the inner surface was smooth. The spinal cord was seen to be entirely severed at this level. There were fibrocaseous ulcerative tuberculosis of the lungs, fatty degeneration of the liver and kidneys, trophic ulcers, etc.

CASE 7.—M. T., woman, aged 25, entered my service at the Cook County Hospital, July 26, 1915, with a history of tuberculous spine disease of two years' duration for which she had been treated. About three weeks previous to her entrance to the hospital, her legs became weak and finally she was unable to move them. She also suffered from incontinence of urine.

There are typical symptoms of compression myelitis, and a kyphos in the upper as well as in the lower dorsal region of the spine. Roentgenograms show apparent necrosis of the bodies of the fourth, fifth, sixth, seventh and twelfth dorsal and first lumbar vertebrae, and also a shadow in the region of the middle to the lower dorsal vertebrae, denoting abscess formation.

The diagnosis is tuberculous spine disease with paraplegia.

Dec. 15, 1915, necropsy revealed a focus of encapsulated, fibrous, caseous tuberculosis in the apex of the right upper lobe of the lung; bilateral fibrous adhesive pleuritis; marked bilateral disseminated bronchopneumonia; between the third and fourth dorsal vertebrae, there was a possible partial dislocation of the spine; that is, there was a necrosis of the bodies of the second, third and fourth dorsal vertebrae, and between the third and fourth, this necrosis was so marked that the normal intervertebral attachments were loosened to permit of marked abnormal mobility. The bodies of these bones were, so to speak, collapsed on each other. In opening the ileopsoas group of muscles on either side, there was a large quantity of yellowish, cottage cheese-like material which had excavated a cavity in these muscles approximately 4 by 18 cm. There were sinuses leading from the upper end of these cold abscess cavities to the region of the twelfth dorsal and the first lumbar vertebrae. The bodies of the seventh, eighth, ninth, tenth, eleventh and twelfth and the first lumbar were necrosed, of softened consistency, and yellow. Between the twelfth dorsal and the first lumbar there was so much necrosis that here, too, the bodies had collapsed to make the angular deformity described in the lumbodorsal region. On removal of the spinal cord there was a marked narrowing of the spinal canal in the upper dorsal region adjacent to the third and fourth dorsal vertebrae. This narrowing was so marked as to have caused a definite marked narrowing of the adjacent spinal cord. The dura mater in this region was greatly thickened, and on its exterior surface had a granular appearance and yellow color as that found in the adjacent bone. In the lumbodorsal region, there was no narrowing in the spinal canal. The dura mater at this point, however, was greatly thickened, and there was some dependent edema of the leptomeninges. There were no adhesions between the leptomeninges and the dura mater in any part of the cord. The lumbodorsal bone necrosis was at the level of and below the beginning of the cauda. Between the dura and the bodies of the lower dorsal vertebrae, there was an infiltration of cheesy material. This infiltration is an extension from the necrosed dorsal and first lumbar vertebrae. The deformity in the upper dorsal region has been produced by a slight collapse of the bodies of the third and fourth vertebrae; the deformity not being great, the collapse is not great. The necrosis of the arches of these vertebrae is so great that the narrowing of the spinal canal is in the lateral rather than in the anteroposterior diameter. This encroachment on the lumen of the spinal canal is due to an infiltration of the dura with caseous material and the consequent fibrous infiltration of that membrane.

Microscopically the spinal cord gave the typical picture of so called diffused myelitis, that is, the cord had the Swiss cheese appearance, numerous vacuoles, swollen axons, broken up myelin and the so-called ameboid transformation of glia. The vessels showed marked infiltration of the adventitial lymphatic spaces. In addition there were present signs of secondary degeneration.

SUMMARY

Compression myelitis may be the first clinical sign of an unsuspected Pott's disease, often unmasked by roentgenograms. The severity of the compression is correspondingly shown by the intensity of the clinical phenomena.

Intraspinal abscess is the dominant factor in subjecting the spinal cord to pressure, borne out by laboratory examinations and postmortem findings. At first the pressure may not make any appreciable alteration in the nerve element, but sooner or later there is severe damage to the cord resulting in primary and secondary degeneration; in time actual necrosis and severing of the cord may occur as already recorded. It therefore follows that the paraplegia will be complete and permanent, though occasionally it may be but partial: As a rule, death may be anticipated—generally from pulmonary tuberculosis. It cannot be denied, however, that complete recovery may take place even after the paralysis has existed for a long period of time. But in this connection a second factor must be considered in

the mechanism of compression, namely, tuberculous granulation tissue most commonly occurring in children, which invades the vertebral canal, and a moderate pressure is manifestly enough to excite functional disturbance without necessarily having an actual mechanical destruction of the nervous elements. This fact is of practical importance, as it explains the cause of recovery, which occurs by absorption of the tuberculous granulation tissue.

No reliance can be placed on operative procedure. Where laminectomy has afforded relief, it has been due to the accidental evacuation of the abscess; it is a serious operation and the immediate mortality is large.

ABSTRACT OF DISCUSSION

DR. C. B. FRANCISCO, Kansas City, Mo.: Formerly we were taught that Pott's paraplegia was, as a rule, the result of bony pressure. It is now generally considered that the pressure is due either to granulation tissue, abscess formation or an extension of the process to the meninges. In children I believe that the pressure is usually the result of granulation tissue, and that recovery is the rule. Occasionally a child will not recover completely. Recently I had a necropsy on a child who had had very efficient treatment for ten years; it had started off with the paralysis early in the disease, and had been continuously paralyzed, walking, at times, with considerable difficulty. In that case, we found a direct extension to the meninges (that is, an infiltration due to extension of the process); but these cases, I believe, are very rare. There is seldom bony pressure in children, if ever. In adults, it has been my observation that a case of tuberculosis of the spine developing paraplegia is going to continue to have signs and symptoms of the paraplegia. Whether the original pressure is due to abscess formation or meningeal involvement, it is maintained sufficiently long to produce destruction of the cord structures and removal of the pressure then does no good, therefore it is useless to do a laminectomy. These cases will continue to have exaggerated reflexes and considerable difficulty. It is rather rare, I believe, to see a case that improves as much as the one Dr. Jacobs reports, in which the patient became able to walk very well, but still had the reflexes exaggerated.

DR. J. T. RUGH, Philadelphia: My experience rather leads me to feel that the prognosis in adults depends very much on the involvements or complications in other parts of the body. If the patient does not have any pulmonary lesion or any active lesion in other parts of the body, the prognosis of the spinal condition is better. A year or so ago, I had a case of paralysis of about a year's standing, in the Philadelphia General Hospital. As a last resort, and because of inability to control the patient as he was, I placed a bone-graft in the spine. Six months later, he met me in the corridor, walking around with a cane. It is now two years since the graft was inserted, and he is now driving a dray in the city. I have been able to duplicate that result in several other patients with disease of a similar type, in which there was no complication. Those of my patients who have not recovered or have shown no improvement have usually died of complications, pulmonary, renal, or whatever they might be.

DR. A. L. FISHER, San Francisco: There ought to be a complete neurologic examination in all these cases as a routine. For the last year we have been making not only the examination of the motor nerves and reflexes, but also of sensibility, tactile sensation, cold and heat sensations, etc. Although the results are not yet sufficient to draw any conclusions, I have seen some evidence that there are in some instances disturbances of sensation before any evidence of motor impairment is shown.

DR. REGINALD H. SAYRE, New York: I agree with Dr. Rugh that it is the lesion in some other part of the body that generally proves fatal in these cases, and my personal experience has been that a much larger number recover with good function than would seem to be the history with the patients whom most of the other gentlemen have seen. I have under treatment at present three adults who were paralyzed for periods of from six to eighteen months. They had both sphincters paralyzed; and in two cases there were bedsores. These patients have practically recovered. Two of them are supporting themselves. The other patient has so far recovered as to be able to move around the ward with difficulty; but she has improved so much within the last six months that I think she will make a good recovery ultimately. She was a mass of bedsores when she first came under my observation; and a diagnosis of transverse myelitis had been made, Pott's disease not being suspected. Nothing had been done; but with traction and hyperextension in bed, she began to recover very soon. She has slowly increased in her capability of looking after herself, and is, I believe, on the way to recovery. In most of the fatal cases that I have seen, the pressure was in the cervical region. I have seen several that went to a fatal termination, and there was marked meningitis at the time of death—the cerebral meninges being involved as well as those of the cord.

DR. F. J. GAENSLEN, Milwaukee, Wis.: I want to report a procedure that I used in two instances in which the paralysis came on suddenly, and in which the condition would probably have terminated fatally otherwise. The first thing I did was a laminectomy, splitting the spines as you would in an Albee operation. The advantages of that are that when you close up the wound, you have a very firm line of union. In addition to the laminectomy, I put in a tibial graft over the laminectomized portion of the spine. In one instance, I removed the laminae of the fourth, fifth and sixth cervical; and in the other three laminae in the dorsolumbar region.

DR. JAMES T. WATKINS, San Francisco: I want to report progress in a case belonging to the group described by Dr. Jacobs. The patient was a young woman with a complete paraplegia and multiple sinuses pointing in her back low down. In the hope of inducing these abscesses to discharge elsewhere and so enable me to get a clean back to operate on, I had her put on an inclined plane. My hopes were realized. In time she developed sinuses in each groin and those in the back healed up. Shortly afterward I went off service and Dr. Sherman took the case over. He did a laminectomy and removed a large tuberculoma from the neural canal. The outcome to date is most gratifying. It is less than six months since the operation and she already walks with assurance.

DR. EDWARD S. HATCH, New Orleans: I agree with Dr. Rugh that if they do not have other complications, these adult patients do well. I see many adult negroes come to the Charity Hospital with paraplegia or great weakness; and in the cases in which there are no other complications, the prognosis is good. I have one man who was absolutely paralyzed, but who could get around a little in three months and is steadily improving. It is a great mistake to say that we cannot do anything for these patients.

DR. ALBERT H. FREIBERG, Cincinnati: There is very little difference of opinion as to the correctness of the general considerations which Dr. Jacobs has placed before us. At the same time, I question whether we may applaud all that he has said with reference to these cases, whether in child or in adult. The demonstration of an abscess around the spinal column in a roentgenogram in a case of paraplegia does not prove that the abscess stands in direct relation to the paraplegia. Neither is it possible to be quite so definite as to what is going to happen as the result of conservative treatment in child or adult. The proof cannot be seen in the roentgenogram, but in the conduct of the case. What is important is that we should first use adequate mechanical means for placing the spine in a properly corrected position and for maintaining an exact immobilization with comfort to the patient and for a sufficient length of time to be able to judge, by the patient's behavior afterward, whether he is improving or not. If he is not, we are not accomplishing what we are after; and then the question of some other kind of intervention comes up. This is as true with reference to the child as to the adult, but the difference between the two classes of cases lies in the fact that improvement is more likely and more rapid in the child than in the adult. For these cases it is my custom to use the Lorenz plaster bed, and not the Bradford frame for immobilization. By this means, I can secure what we call hyperextension, but which it would

be better to describe as a corrected position; and, in addition, I hope, a greater degree of immobilization. This appliance is always under control, and enables one to see that the patient receives proper care of the skin. Our experience has been most gratifying in the treatment of these cases. I may have been more fortunate than most. We are going through this experience with some cases now. The ultimate fact to be looked for is continuous improvement, even though slow. So long as that is going on, I feel that we are moving in the right direction.

DR. C. M. JACOBS, Chicago: I do not deny that some patients get well; but what I have tried to bring out is that when this occurs the pathologic lesion is a tuberculous granulation tissue rather than an intraspinal abscess. We know that most children with Pott's paraplegia get well; on the other hand, my records show that out of twenty-four adult cases, sixteen were known to end fatally. Children with Pott's paraplegia are placed on a Bradford frame, with or without traction, and as already stated they usually get well. The roentgenograms in these cases do not show a shadow indicating abscess. When the roentgenograms show abscess formation there is more or less permanent paralysis. At the Home for Crippled Children, I have two patients with Pott's disease who have been paralyzed for the past two years. I have tried in every way to modify the condition by different methods—particularly with rest, but without success. The roentgenograms show a shadow which I have diagnosed as an intraspinal abscess. According to my observation, Pott's paraplegia in adults, due to intraspinal abscess, is usually followed by complications such as pulmonary tuberculosis, bronchopneumonia or tuberculous meningitis. Dr. Sayre did not state whether roentgenograms were taken of his cases and if so, whether a shadow was shown indicating abscess formation.

DR. SAYRE: In both of my cases I believe that there was an abscess present, because, after the disappearance of the paraplegia, abscesses showed themselves—in one case, in the spine, and in the other, in the groin. These abscesses were opened and washed out, and disappeared.

DR. HIBBS: These were intraspinal abscesses, not ordinary abscesses?

DR. SAYRE: I believe that these abscesses had their origin in the spinal canal, as the result of a process going on in the vertebra and elsewhere in the canal. They exerted enough pressure to cause paraplegia. Then, before they were done, they became extraspinal abscesses; and, with relief of pressure in the canal, the paralysis disappeared. This does not occur in all cases, but did in these.

NEURITIS AND PARALYSIS AS A COMPLICATION OF THE INTENSIVE PASTEUR TREATMENT

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Remlinger,[1] Stimson,[2] Simon,[3] Hasseltine[4] and Fielder,[5] in a summary of the literature with a report of their personal cases, show the sum total of paralyses following the Pasteur treatment to be 142, with twenty-four deaths. With the additional cases described in Table 1, the number of paralyses is increased to 150, without taking into consideration the seven cases reported as neuritis. Attention is particularly called to the two cases of optic neuritis heretofore not described in the literature. With the etiology of this complication very much in doubt, it is best that one call attention to the seemingly important factors of the cases in this series.

TABLE 1.—PARALYSES

Case	Diagnosis in Biting Animal Based on: Negri Bodies or Inoculation; Observed Symptoms; Suspicious History	Onset Days After: Bite	Onset Days After: Beginning Treatment	Site of Involvement	Time of Recovery
1	+	21	17	Unilateral facial paralysis	Traces 9 months later
2	Treatment taken as a precautionary measure	..	28	Partial paralysis legs; considerable diarrhea present.	Six weeks
3	+ No bite; supposed cuts on hands.	21	15	Paralysis legs; partial paralysis arms and face sphincters	Partial recovery 3 weeks later
4	+	24	17	Paralysis both legs; cerebrospinal fluid withdrawn and inoculated subdurally into guinea-pigs, with negative result	Several weeks later
5	+	18	13	Bilateral facial paralysis, with involvement of lower limbs, sphincters, and, to a smaller extent, the arms; prodromal symptoms of extreme nausea and severe local reactions, with rise of temperature	Traces 16 months later
6*	Dog well; treatment taken as a precautionary measure, and self-administered	12	10	Paralysis both legs and sphincters; simultaneous with the beginning of involvement of nervous system there was a "flaring up" of all previous local reactions with a sharp rise in temperature	Traces 7 months later
7*	Pricked on thumb with needle while administering the Pasteur treatment	..	17	Paralysis of legs	Several months
8	+	..	17	Paralysis of legs and sphincters; severe local reactions after each injection, the paralysis following unusually severe ones; no rise of temperature	Reported slowly improving four months later

*Physician.

STUDY OF CASES

1. The percentage of involvement of the central nervous system including the cases of neuritis in the series of intensive Pasteur treatments in which these cases occurred, numbering approximately 1,600, was 0.9 per cent. This percentage is in excess of what is usually reported, and would lead one to believe that many cases go unrecognized. Considering the paralyses alone, the incidence was 1:200 in those treated in this series.

2. No children were affected. It is of interest to note that Cases 6 and 7 were in physicians.

3. The paralysis occured in one person (Case 2) who was not bitten. Again, it occurred in one person

1. Remlinger: Accidents paralytiques au cours du traitement antirabique, Ann. de l'Inst. Pasteur, 1905, **19**, 625.
2. Stimson, A. M.: Facts and Problems of Rabies, Bull. 65, Hyg. Lab., U. S. P. H. S., 1910.
3. Simon: Ueber Lähmungen im Verlauf der Tollwutschutzimpfung, Centralbl. f. Bakteriol., Orig., 1913, **68**, 72.
4. Hasseltine, H. E.: Paralysis During Antirabic Treatment, Pub. Health Rep., Oct. 24, 1913, p. 2220; ibid., July 30, 1915, p. 2226.
5. Fielder, F. S.: Paralysis During Pasteur Antirabic Treatment, THE JOURNAL A. M. A., June 3, 1916, p. 1769.

(Case 6) who was bitten, but not by an animal which was rabid.

4. Cases 4, 5 and 6 were treated with the same set of virus with fifteen others. This virus was checked culturally, aerobically and anaerobically, with sterile results. From these cases one would be led to believe that there was some idiosyncrasy on the part of the ones affected. An idiosyncrasy not being a complete explanation, one would consider the symptoms presented as a result of fixed virus infection.

5. In Cases 2, 5 and 6, observed personally, one would be apt to judge the patients as having such temperaments as to predispose to some involvement of the nervous system.

6. In Cases 2, 3, 4, 5, 6, 7 and 8, the condition was apparently a myelitis, yet in others the peripheral nerves seemed most involved. Facial paralysis alone was noted in one case (Case 1). There is no doubt that bulbar symptoms were present in Case 5. The involvement may be of a selected nature, as shown by Cases 11 and 13.

7. In Case 3, though the treatment was discontinued and resumed with no ulterior results, I am convinced

TABLE 2.—NEURITIDES

Case	Diagnosis in Biting Animal Based on Negri Bodies or Inoculation	Onset Days After: Bite	Onset Days After: Beginning Treatment	Site of Involvement	Time of Recovery
9	+	34	31	Spasmodic contraction muscles side of neck	Several weeks
10	+	48	45	Spasmodic contraction muscles side of neck	Several weeks
11	+	28	19	Double optic neuritis followed by complete blindness of a few days' duration	7 weeks
12	+	34	30	Severe pains left eye, later affecting side of face, occurring at intervals	2 weeks
13	+	21	17	Double optic neuritis followed by complete blindness with gradual recovery of vision	Several weeks
14	+	..	..	Continuous vomiting.....	Immediate
15	+	21*	18*	Extreme numbness of fingers and toes with some extension to arms and legs	Several weeks

* Contact

from observations of Cases 5 and 6 and the alarming symptoms presented that the continuation of the treatment was bad judgment. There must be a border line, so to speak. The latter cases around the seventh day of treatment presented definite prodromal symptoms of nausea and temperature. In Case 6 the treatment was discontinued for two days, with a return of the patient's condition to normal. The resuming of the treatment brought on an immediate and much aggravated return of the initial symptoms coincident with the appearance of the paralysis.

8. One can easily grant that the local reactions observed during the course of the Pasteur treatment are an indication of the individual's hypersusceptibility to foreign proteins. Then the flaring up of these reactions simultaneously with the beginning of the symptoms of involvement of the nervous system observed in Case 6, and to a lesser degree in Case 8, is most interesting. These cases readily support the anaphylactic theory.

9. The shortest incubation period of the paralyses was ten days. In one instance it was twelve days, in one thirteen days, in one fifteen days, in three seventeen days, and in one twenty-eight days.

COMMENT

There is no doubt that in some persons to whom the intensive Pasteur treatment is administered, 0.9 per cent. in our series, taking into consideration the cases of neuritides presented, there occurs some involvement of the nervous system, with possible serious results. Therefore the intensive Pasteur treatment is not without danger, and warning should be given accordingly.

This involvement may be of the nature of a definite myelitis which is most probably rabic. The short incubation period as demonstrated in the cases reported here seems characteristic of fixed virus, yet it must be remembered that comparatively as short an incubation period is seen in cases of human rabies,[6] as a result of street virus infection, overwhelming in every instance. No single etiologic factor can explain every case, as in Case 6 in my series. The patient was not bitten by a rabid animal. Either theory—an idiosyncrasy anaphylaxis, or fixed virus—is applicable to this case. Though continuation of the Pasteur treatment in some of the cases of paralyses may not appreciably affect the course of the disease, in others it may be fraught with grave danger, as illustrated by Case 6.

6. Geiger, J. C.: Human Cases of Rabies in California and Their Treatment, California State Jour. Med., June, 1916.

THE HECHT-WEINBERG-GRADWOHL TEST IN THE DIAGNOSIS OF SYPHILIS

ITS SUPERIORITY OVER THE WASSERMANN TEST IN UNTREATED AND TREATED SYPHILITICS *

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It has taken about one decade to introduce the Wassermann test into the field of diagnosis. It is now recognized as one of the most valuable laboratory aids that has yet been brought into routine use. It is so nearly specific in differentiating between syphilitic and nonsyphilitic conditions that for all practical purposes we may conclude that a positive Wassermann means syphilis.

This reaction is usually performed by competent workers along the lines originally laid down by Wassermann and the so-called Berlin school of serology. As a pupil and follower of that school I have insisted on the carrying out of a technic similar in all details to that originally advocated by Wassermann, with the exception of replacing the watery extracts of antigenic substance by one or more of the much superior alcoholic preparations. Using, therefore, the so-called "classical Wassermann" with the proper alcoholic antigen, cholesterinized or not as the case may be, I have seen every phase of the development of this reaction, and have watched it from the standpoint, not only of the laboratory, but also with the interest of a clinical observer in syphilis. With this experience I have long since come to recognize in this test a splendid method of syphilitic diagnosis and at the same time have come to regard its negative presence in many instances as a sore disappointment in clinching a diagnosis in which almost absolute clinical evidences of the disease were at hand. In other words, like others, I have long since

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

been forced to conclude that a positive Wassermann is laboratory proof of syphilis, but that a negative Wassermann is by no means a method of proving that syphilis does not exist.

The Wassermann test, while therefore a boon to us in diagnosis, is at the same time, in other instances, a crushing disappointment. How often does this occur? It is almost impossible to estimate accurately the percentage of positives that are to be found in all syphilitic cases that are daily examined throughout the medical world. My own experience of nine years in the work entitles me to estimate it in terms of possibly 60 per cent., that is, of all syphilitics examined, including blood and spinal fluid Wassermann reactions, we will get 60 per cent. of positive findings in all untreated patients who have passed beyond the primary period.

With these figures before us, it might be well to inquire into the meaning of the 40 per cent. negatives in manifest syphilitic conditions. Is this a fault of the technic or is it due to a temporary or permanent disappearance in the reaction in certain persons and in certain phases of the infection, regardless of the application of specific medication? I would answer as a result of my experiences that it is due partly to the first cause and partly to the second. I say this advisedly, because I have been able to add 15 per cent. to the column of positives by utilizing another test which eliminates those errors inherent in the test itself. I have been unable to add much to the percentage of positives by eliminating faults due to factors inherent in the idiosyncratic factors of the patient or of the disease, unknown factors that make his blood and spinal fluid consistently negative at certain times and under certain conditions. I do not include, in the latter statement, however, my use of the "provocative" method of producing positives by means of arsenobenzol injections.

About four years ago my attention was called to the method of Hecht and Weinberg[1] in demonstrating the presence of the syphilitic antibody, if such it may be termed, by a method first described by them. I had repeatedly tried out methods of making Wassermann tests other than that used by the Berlin school, but in each instance found none of them in any sense superior in point of accuracy to the original method. There were, however, certain elements in the method of these workers that logically recommended at least a trial of their methods. In first order I might mention the fact that the method utilized unheated serums. This is undoubtedly a point of superiority over the Wassermann, which utilizes inactivated or heated serums. Heating of blood serum for the purpose of destroying complement unquestionably also destroys part of the syphilitic antibody or substance responsible for complement fixation. If this is true, in the presence of a small amount of this substance the performance of a Wassermann test with inactivated serum most certainly will tend to produce a negative result. Another explanation of this may be found in the claim of those who believe there are two kinds of syphilitic antibody, one thermolabile, the other thermostable; that in some cases and under certain conditions the thermolabile factor predominates and under other conditions the thermostable. Granting that a test were to be carried out while a serum was charged with thermolabile antibody and weak or deficient entirely in thermostable body, inactivation would necessarily destroy the element that would complete complement fixation and give a negative result where a positive should and would have been obtained with an active or unheated serum.

This fact seems to have some support in addition to my observation from Vladimir Busila,[2] who showed that both blood and spinal fluid contain two syphilitic amboceptors, one thermostable or unaffected by temperature of 56 C. and the other thermolabile, that is, destroyed by that temperature. He states that one or both may be present and in various proportions. The thermolabile is the first to appear in the blood on syphilitic infection and the last to disappear under treatment. When both amboceptors are present, the Wassermann reaction yields a weaker result when the serum is previously heated than when it is not. He states also that when the thermolabile amboceptor is present alone or nearly alone, the Wassermann reaction with heated serum gives a negative result, but without heating, a strong positive result. The negative blood Wassermann performed with the ordinary technic which includes preliminary heating, is not, therefore, a proof of the absence of syphilitic amboceptor. Busila also makes the observation, which is rather interesting, that syphilitic cases with a positive reaction exclusively in spinal fluids are rare, much less common than is generally thought, and includes cases mainly in which the blood amboceptor is exclusively of the thermolabile variety, or nearly so. He states, in the light of his own observation, that by the performance of the blood Wassermann with unheated serum one may thus generally dispense with the cerebrospinal fluid Wassermann. He further believes that the thermolabile amboceptor often exists alone in cases of latent, inadequately treated or nervous syphilis, and the Wassermann reaction performed with the original technic is thus unavailable, precisely in the cases in which it is most needed.

Again it must be remembered that the Wassermann technic does not take into account the presence of natural antisheep amboceptor. The presence of antisheep amboceptor in the blood serum of persons depends, it is assumed, on the ingestion of mutton. It is impossible to state just how much mutton must be ingested before natural amboceptor appears in the blood. We have seen it present in fairly large amounts in persons as young as 12. The amount of this substance varies within wide limits, as we shall see later. It is fair to assume that if in the Wassermann reaction one utilizes a certain amount of amboceptor made from rabbit's serum and fails to take into account the amount naturally present, then the balance for the hemolytic system which our titration experiments have established as a prior step to the performance of the actual test is seriously impaired. If, for instance, 0.5 c.c. of a 1:2,000 dilution of rabbit antisheep amboceptor will hemolyze 1 c.c. of a 5 per cent. sheep corpuscle suspension, and already sufficient amboceptor is present in the patient's serum to hemolyze 1.5 c.c. of sheep corpuscles, as I have frequently noted in my work, then the balance is most seriously disturbed and reliable work cannot be carried out.

The method of Hecht and Weinberg was pointed out to me during my stay in Paris, by Leredde particularly. The method obviously has much to recommend it in that it utilized unheated serums and took into account the presence of natural amboceptor and natural complement. The method was put on trial, and

1. Hecht and Weinberg: Wien. klin. Wchnschr., 1909, **22**, 256.

2. Busila, Vladimir: Presse méd., Sept. 23, 1915.

the principles already mentioned readily asserted themselves as eliminating the errors inherent in the classic Wassermann. After working out Hecht and Weinberg's method, I determined on the expedient of estimating the exact amount of complement and amboceptor present in each serum, and utilized only the exact amount of sheep corpuscles hemolyzable by that much amboceptor and complement. In other words, my work with this test added to the accuracy of the "balance" of the hemolytic system. The method which I used and first reported before this Association[3] is as follows:

Place in a rack fourteen small test tubes. The first ten of these tubes are used to determine the hemolytic index of the suspected blood. By this I mean the exact amount of hemolytic amboceptor present in the given blood serum. The last four tubes are used in the actual test. Add 0.1 c.c. of fresh unheated patient's blood serum to each of the first ten tubes. Then add decreasing amounts of normal salt solution to these tubes, beginning with 1 c.c., then, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2 and 0.1 c.c. to the succeeding nine tubes. Next add increasing amounts of fresh 5 per cent. suspension of sheep's blood, starting with 0.1 c.c. and ending with 1 c.c. Place the rack in the water bath for one-half hour. The tube which last shows complete hemolysis constitutes our "hemolytic index"; if it is Tube 4, our index is 4, because this tube had received 0.4 c.c. of sheep's corpuscles to be added to the last four tubes. The first three tubes (11, 12 and 13) constitute the tubes for the actual test, while the last tube in the rack (Tube 14) serves as our serum control tube. Tubes 11, 12 and 13 receive, therefore, the patient's serum, the proper amount of sheep's corpuscles, dependent on hemolytic index, rising strengths of antigen, but no complement and no amboceptor. Tube 14 receives only sheep's corpuscles, but no antigen.

In my technic I use 0.1 c.c. of a diluted antigen, determined by titration in tube 11, 0.15 c.c. antigen in Tube 12, and 0.2 c.c. in Tube 13. In order to equalize the volume of fluid in all these tubes, I add 0.2 c.c. normal saline to Tube 11, 0.15 c.c. to Tube 12, 0.1 c.c. to Tube 13, and 0.3 c.c. to Tube 14. The tubes are then agitated and placed in the water bath for half an hour. These last four tubes are filled at the time I make the additions to the first ten and are left with them in the water bath for one-half hour for fixation of complement. The rack is then taken out and the hemolytic index computed. If the index is low, say from 1:4, I add 0.1 c.c. of sheep's blood to the last four tubes. If the index is between 5 and 7, I use 0.15 c.c. sheep's blood to the last four tubes; if between 10 and 15, I use 0.25 c.c.; if between 15 and 18, I use 0.3 c.c.; and if between 18 and 20, I use 0.35 c.c. If the patient's serum has an index below 3, I regard the reaction as of doubtful value. If it is above 3, I regard it as absolute. The reaction is read off exactly as in the Wassermann, that is, inhibition or noninhibition of hemolysis. If the amount of complement or natural antisheep amboceptor is very low, we can add the proper amount of guinea-pig's serum or rabbit's immune serum, ascertained by preliminary titration.

The particular advantage of this test is the fact that we are dealing with unheated serums, avoiding the chance of the development of complementoid substances. I wish to state that the Hecht-Weinberg-Gradwohl test has never been found negative in any blood serum which showed a positive Wassermann, but it has frequently been found positive in blood serums that show a negative Wassermann. Thus, its advantage can readily be seen.

Having worked out the technic I have consistently followed it up with a close comparison with the classic Wassermann. In every test carried out by me for complement fixation diagnosis of syphilis I have performed both the Wassermann and the Hecht-Weinberg-Gradwohl. Many of these tests were performed without any knowledge of the clinical history in advance, and my reports were unhesitatingly given to my clinical consultants, sometimes showing a positive in both tests, sometimes showing a negative Wassermann and a positive Hecht-Weinberg-Gradwohl, sometimes showing negative both, but never showing a positive Wassermann and a negative Hecht-Weinberg-Gradwohl. At first I was astonished at the frequency of the "dissociated reaction," by which I mean the negative Wassermann and the positive Hecht-Weinberg-Gradwohl. Later I lost my astonishment and came to the conclusion that the method I used in eliminating the factors of errors inherent in the Wassermann had thoroughly justified me for the additional time spent on it. We found that in no instance where we obtained a positive Hecht-Weinberg-Gradwohl and a negative Wassermann was our work at fault or our serologic diagnosis a surprise to the clinician. We must confess that there are still certain cases of syphilis in which both tests were negative which were really syphilitic, as proved by true clinical manifestations and later the appearance of positive reactions in one or both tests at a subsequent examination. These were invariably cases of latent syphilis in robust individuals. We wish to add, too, that the use of cholesterinized antigens does not measure up in accuracy to the use of the Hecht-Weinberg-Gradwohl test as a serologic test for syphilis. We have carried out both Wassermann and Hecht-Weinberg-Gradwohl, and have utilized all the different antigens now in common vogue. We have lately tried out the use of cholesterinized human heart antigen in an endeavor to compare the results obtainable with this method to those obtainable with a noncholesterinized antigen in the Hecht-Weinberg-Gradwohl technic. We must announce that the Hecht-Weinberg-Gradwohl frequently gave undoubted positives when the cholesterinized human heart antigen in the straight Wassermann technic failed to do so. In other words, our positives with the Hecht-Weinberg-Gradwohl cannot be explained on the basis of increasing the *sensitiveness* of the antigen: they can be explained only on the basis of the elimination of the factors at fault already enumerated. Furthermore, I wish to be understood as stating that when I speak of negative Wassermann and positive Hecht-Weinberg-Gradwohls, we do not mean a *faint inhibition* in the latter and a *complete hemolysis* in the former. The results are astonishingly different and striking, on the one hand a clean-cut negative Wassermann, on the other a definite and distinct, positive Hecht-Weinberg-Gradwohl.

A recent publication by Sellards and Minot[4] alludes to the fact that the writers in fourteen cases in only 134 found natural amboceptor in the amount of two or more units. They also mention that where they depended on natural sheep amboceptor no hemolysis occurred and there was no apparent explanation for this lack of hemolysis except the inefficiency of the natural amboceptor. These statements, while based on an absurdly small number of cases and under conditions unknown to us, are so utterly at variance with our findings and our previous statements that we feel it necessary to dwell on them at some length here. Our personal experience now with something like

3. Gradwohl, R. B. H.: The Hecht-Weinberg Reaction as a Control Over the Wassermann Reaction, THE JOURNAL A. M. A., July 18, 1914, p. 240.

4. Sellards and Minot: The Antagonistic Action of Negative Sera upon the Wassermann Reaction, Jour. Med. Research, May, 1916.

5,000 comparative Wassermanns and Hecht-Weinberg-Gradwohls show that at least 98 per cent. of the people examined for complement fixation have some amount of natural antisheep amboceptor present. This amount, expressed in terms of "hemolytic indexes," that is, amount of sheep corpuscle suspension in tenths of 1 c.c. hemolyzable by 0.1 c.c. of serum, varies between the limits of 1 and 20. For instance, the accompanying table, compiled from our complement fixation work from May 1, 1915, to April 30, 1916, shows the number of cases, the total hemolytic indexes and the average.

NUMBER OF CASES, TOTAL HEMOLYTIC INDEXES, AND AVERAGE

Month	Cases	Total Hemolytic Indexes	Average Number of Units of Natural Antisheep Amboceptor
May	236	485	2+
June	245	810	3+
July	208	901	4+
August	222	986	4+
September	215	1,301	6
October	216	1,312	6
November	221	1,600	7
December	213	812	3+
January	256	1,610	6
February	254	1,090	7
March	262	1,146	7
April	229	780	6
Total	2,777	Total average	5

In other words, the average beginning May, 1915, of units of natural amboceptor present was 2 plus, running up to an average of 7 in November and declining to 6 in April, 1916. A number of times we have found an index as high as 15. The highest we have found was a case recently with 20. Our figures for previous years run approximately the same as those for 1915-1916.

In what class of cases and under what conditions are we liable to find the Hecht-Weinberg-Gradwohl positive and the Wassermann negative? We might say that in cases in all periods of syphilitic infection is this finding likely to be found. We have found manifest secondary syphilis with a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. We have found it again in so-called latent syphilis, in cases of tabes dorsalis, in tertiarism. I am referring now to untreated cases. In cases of congenital syphilis, we have found it time and again. Every Wassermann worker is familiar with the frequent negatives found in this group of cases. We have in general found it present in 15 per cent. more cases than the Wassermann, irrespective of the period of the disease or whether treatment had or had not been instituted. Leredde has called attention to the "dissociated reaction" in ocular syphilis.

For the purpose of illustrating the character of cases and the circumstances under which we have obtained what we term a "dissociated reaction," that is, a negative Wassermann and a positive Hecht-Weinberg-Gradwohl, I shall quote the following histories from a large number in our records:

CASE 1 (8542)—Patient of Dr. Jost. Treated from December, 1915, as follows: Six-tenths gm. salvarsan followed by mercurial (gray) oil 1 grain once a week up to Jan. 6, 1916. Then intravenously 0.6 gm. salvarsan followed by weekly injection of mercuric salicylate, 1½ grains, up to Feb. 4, 1916, then 0.6 gm. salvarsan intravenously followed by weekly injections of mercuric salicylate, 2 grains. March 4, 0.6 gm. salvarsan intravenously. Patient disappeared from service, and returned, April 2, expressing a belief that he was cured. Blood at the time gave a negative Wassermann, positive Hecht-Weinberg-Gradwohl.

CASE 2 (8024).—Service of Dr. Hauck. This case came under observation, December, 1914, for a neglected tertiary lesion affecting the vomer and tissues of the posterior nares, decided necrosis with odor of necrotic bone. Wassermann was ++++. Patient was put on mixed treatment with four intravenous injections of neosalvarsan, mixed treatment with tonics, continued to date. Subsidence of all symptoms, area of necrosis all healed over. March 18, 1916, negative Wassermann, positive Hecht-Weinberg-Gradwohl. As result of these findings, patient was continued under treatment.

CASE 3 (6805).—Service of Dr. Crowley. This man was exposed in August, 1912, when he was 19 years of age. Chancre appeared at some time after two weeks. He first came under observation the latter part of November of that year. The first of December the cutaneous eruption was present. He used inunctions of mercury till the first of February, 1913. From that time until the middle of December he took yellow mercurous iodid. Then for two months he used inunctions again. From the middle of February, 1914, till October, 1915, he took yellow mercurous iodid faithfully. From the middle of October till January 5 he took no treatment. January 5, Wassermann was reported doubtful only because of the clinical history. A single dose of salvarsan was given, March 1, and a second Wassermann was reported negative. At this time the patient was advised to discontinue treatment till about the first of January, and then have a Wassermann made. Owing to the illness of the attending physician, this was not done, and the patient began to imagine all sorts of things, one being that he had infected his whole family. His mental condition became so bad that he insisted on having another dose of salvarsan, and this was administered, Feb. 1, 1916. On the 9th he brought his father to the office and insisted that a specimen of his blood be sent to the laboratory for examination. This was done and was reported from our laboratory under the date of February 12, negative in both reactions. His own blood was sent in February 16, and was reported negative Wassermann and positive Hecht-Weinberg-Gradwohl. He has received no further treatment, although he has been advised to do so. Had a mild attack of grip during March that worried him considerably.

CASE 4 (3495).—Patient first came under observation at the age of 22. Had been infected at the age of 17. Infection in this case occurred in August, 1909; manifestations mild, secondary eruption mild. Began treatment, Sept. 15, 1909, of yellow mercurous iodid, from 1 to 4 grains daily, continuing until May, 1910; then six injections in gluteal muscles (one injection weekly) of 10 per cent. mercuric salicylate in liquid petrolatum, each injection 4 minims. This was followed by 3 to 6 yellow mercurous iodid pills daily, ⅓ grain each, also solution of potassium iodid, about 30 grains daily for three months. No further treatment until March and April, 1912, when one injection of mercuric salicylate same as above was given weekly for the two months, followed by no treatment until August 27, when 0.6 gm. salvarsan was administered intravenously. No further treatment was given. October, 1913, Wassermann negative. Jan. 30, 1914, Wassermann negative. Aug. 31, 1914, Wassermann negative, Hecht-Weinberg-Gradwohl positive. It may be also of interest to know that since then this patient had an injection of 0.6 gm. neosalvarsan about May, 1915, then about September, 1915, Wassermann showed negative; then, March 1, 1916, we made test: Wassermann, negative; Hecht-Weinberg-Gradwohl, positive.

CASE 5 (4476).—Service of Dr. Johnson. When patient came under observation she had had syphilis of five years' standing. Later had syphilitic baby. At time of examination no signs of syphilis. Results: negative Wassermann and positive Hecht-Weinberg-Gradwohl.

CASE 6 (5130).—Service of Dr. Phillips. This was a case of beginning tabes with incontinence of urine and severe headaches. He had been treated twenty years previously for a short time for a suspicious sore. We found a negative Wassermann and a positive Hecht-Weinberg-Gradwohl.

CASE 7 (3293).—Service of Dr. Boyne. Man, aged 29. History of exposure ten days previously. Typical primary

lesion on glans. No treatment before examination. We found negative Wassermann and positive Hecht-Weinberg-Gradwohl; 0.9 gm. of salvarsan given intravenously the day following this "dissociated reaction." Lesion disappeared rapidly within seventy-two hours. Two weeks later neosalvarsan again given. Patient refused further treatment. Was married subsequently, and had an apparently healthy child.

CASE 8 (3254).— Service of Dr. Winter. Woman, aged 32, came under observation, July 15, 1908. Had been married two years, and had had one child previcus to her marriage, by her husband. Was unable to carry three subsequent pregnancies to term. Her husband was syphilitic, and had been under treatment. Patient took yellow mercurous iodid pills for about two years faithfully, with the result that she gave birth to a healthy child in 1910. In July, 1914, we found an examination of the blood gave a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. She was found to be suffering with a septic endocarditis, of which disease she died in August, 1914.

CASE 9 (8255).—Service of Dr. Caldwell. Woman came under observation, April 7, 1916, some weeks after losing her only child. This child, which was only 14 months old, had been ill only a few days. Patient was extremely nervous, could not sleep or eat. She had been married nine years. First baby had lived twelve days; had sores on body. Then followed two miscarriages and then the child which had lived only fourteen months. Family history showed that mother had four miscarriages before raising a child, and two of her sisters have each had a miscarriage. She made the remark that none of them had ever been able to raise a boy. Father now at the age of about 65 has kidney trouble, and has been suspected of having tuberculosis for several years. Patient had a very bad case of pyorrhea, which she said had run on for years. Skin on hands and at elbows was dry, and edge of tongue was red. Had frequent attacks of diarrhea, appearance of pellagra. Husband a big, healthy fellow, who denied all knowledge of syphilis. Only treatments given her were two injections of sodium cacodylate. This made some improvement. April 18, we obtained a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. Patient's husband denied syphilis, and blood examination showed negatives in both tests. Patient continued on mercuric chlorid, intravenously injected. This was a case of hereditary syphilis. Dr. Caldwell states that he was indebted to the Hecht-Weinberg-Gradwohl for the diagnosis; otherwise, he would have considered this a case of pellagra.

CASE 10 (2931).— Service of Dr. Darner. Patient came under observation with eruption on chest. Diagnosis, syphilitic leukoderma. History of a chancre six years previously, with very small amount of treatment with pills. Wassermann at that time was positive. Present observation is made six years after initial sore, and at this time the findings are negative Wassermann and positive Hecht-Weinberg-Gradwohl.

CASE 11 (6817).— Service of Dr. Lyon. Patient came under observation with a mucous patch and an infection. History of a primary sore. Our findings were a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. The mixed infection yielded to specific treatment.

CASE 12 (6268).—Service of Dr. Galloway. Patient came under observation at the age of 54. Diagnosis was locomotor ataxia. Patient denied syphilis, but admitted gonorrhea. Attended the wife in her first confinement in 1895. Child syphilitic, and died in about a week's time. Advised both patients to take treatments, but they refused. Attended the wife in her second confinement in 1896, when she again had a syphilitic child which died in about a week. Then the husband consented to take treatment at this time, but continued only a short time, because he had no clinical symptoms, and showed no scars, glandular enlargements, or other proofs of infection. Again confined the wife, who had a third syphilitic child in 1897, but which recovered under mercurial inunctions, and is alive and well today. Mother had been treated two months previous to birth of last child. After this confinement the husband again consented to take treatment, and continued it for about one year. Treatment was with yellow mercurous iodid, and later with red mercuric iodid and potassium iodid. He was urged to continue treatment, but he refused. About six or seven years ago he complained of general physical weakness, loss of sexual power and occasional pains in legs. Examination showed Argyll Robertson pupil, Romberg sign, and absence of patellar reflex. Under treatment of red mercuric iodid and potassium iodid, with strychnin intercurrently, he has improved subjectively, and continues at work. Our blood examination, Nov. 27, 1915, showed negative Wassermann and positive Hecht-Weinberg-Gradwohl.

CASE 13 (4826).— Service of Dr. Rice. Patient had had a syphilitic infection some eight or nine years ago. Has been under treatment at intervals since then. She was not receiving any treatment at the time the laboratory finding was made, but certainly had an infection, also stricture of the rectum, which was divulsed some two and one half years ago, and dilation was kept up for a few months. She returned a short time ago and the rectum was again divulsed and she was put on antisyphilitic treatment, since which time she has apparently been doing first rate, but there is no question that she had a syphilitic infection a number of years ago.

CASE 14 (6572).— Service of Dr. Neel. Patient and her husband were infected in 1907. Treatment with mercury and potassium iodid was given for several years, with pronounced success. In the latter part of 1915 he exhibited symptoms of the disease, and had a positive Wassermann. He has been relieved by treatment. His wife exhibited no symptoms of the disease, but showed a negative Wassermann and a positive Hecht-Weinberg-Gradwohl.

CASE 15 (2869).— Service of Dr. Parrish. This was a case of marked tertiary syphilis with no previous treatment. Six months before treatment we found a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. Marked improvement after intravenous injection of salvarsan.

CASE 16 (7950).— Service of Dr. Fischer. History of old syphilis. Diagnosis, diplopia, made two years previous, which cleared up with mercuric chlorid and potassium iodid. Had two years' treatment. Examination gave Wassermann + +, Hecht-Weinberg-Gradwohl +. Received five neosalvarsans, 9 gm. each. An examination made here, Sept. 30, 1915, showed a Wassermann + + and Hecht-Weinberg-Gradwohl +. Then ten injections of salvarsan were given. A third examination showed a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. General result apparently excellent. Still continuing treatment.

CASE 17 (2599).—Service of Dr. Bassett. This patient first came under observation in April, 1913, with the initial sore on the lip. The examination of blood done at this time gave a positive Wassermann. One intravenous injection of salvarsan was given, with internal treatment for seven months, given, not continuously, but interruptedly, when all medication ceased. The following April the patient returned, complaining of sore throat. No patches were observed. The patient simply showed a pharyngitis, which did not improve with gargles and applications. Another specimen of blood was submitted to us, and showed a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. A second dose of salvarsan was then given intravenously, and the patient was treated until Dec. 1, 1915.

CASE 18 (2144).— Service of Dr. Flader. This patient came under observation, Jan. 22, 1914. On examination a large syphilitic ulcer was found over the right scapular, mucous patches of the mouth and tongue, and an ulcerated condition of the mucous membrane of the nose. He had been under the usual mercurial treatment, previously, for about two years, which is about eight years ago. His primary lesion dates back about six years from the time he first consulted Dr. Flader. His treatment consisted only of mercury and potassium iodid by mouth, and there was no other treatment given. Jan. 9, 1914, 0.6 gm. of salvarsan was given intravenously, and six days later all the lesions of mouth, back and nose had disappeared, and to date there has been no return of the trouble, or any other evidences. He claims he will take no further treatment unless the evidences of the disease manifest themselves. Blood examination made here showed, Jan. 28, 1914, negative Wassermann and positive Hecht-Weinberg-Gradwohl.

CASE 19 (5056).— Service of Dr. Thierry. This was a case of imbecility due to hereditary syphilis. Wassermann negative, positive Hecht-Weinberg-Gradwohl.

CASE 20 (6231).— Service of Dr. Thierry. This was a case of mental deficiency due to hereditary syphilis. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 21 (4978).— Service of Dr. Pauley. This patient's family history was negative. His previous venereal history showed gonorrhea in May, 1911, July, 1912, and June, 1913. Jan. 7, 1915, he complained that he had had severe headaches for about one week. They improved somewhat under salicylate, but returned later. April 1, 1915, he was confined to bed with fever and swelling on both frontal sinuses; also severe headache. Feb. 12, 1915, he said he had had a blood test made, which was positive. February 20, he was given salvarsan, and three mercury injections at intervals. He returned, March 28, 1915, and told Dr. Pauley what had been done. The laboratory findings at this time, April 25, 1915, showed a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. May 8, 1915, 0.4 gm. of salvarsan was given. Then he received from 2 to 2.5 c.c. of a 1 per cent. benzoate solution. In May, June, July and August he received, respectively, twelve, nine, nine and two injections. August 22, he reported that his bowels had not moved for three days, and he had had about five or six chills. August 24, he had a chill at 11 a. m., followed by fever; 5:30 p. m. his fever was 102.7 and his pulse 107. August 25, at 9 a. m. his fever was 99.2 and his pulse 96; at 5.40 p. m. his temperature was 100.7 and his pulse 90. Blood examined microscopically showed what we thought to be plasmodium, but owing to staining not being good, the question was doubtful. At no time were there any eruptions or mucous patches, but the lymphatic glands were enlarged, and there were severe headaches. Sept. 23, 1915, he lifted heavy weights, and slipped. Testicle swelled and became very painful. On the following day the testicle was swollen more, and the bowels moved at 11 a. m., September 23, and then nothing would make them move until 4:30 p. m., September 29. The patient was slowly improving when he left the hands of Dr. Pauley.

CASE 22 (6491).— Service of Dr. Gradwohl. This patient has been under two years' continuous treatment, having received four injections of salvarsan with periodic intramuscular injections of mercury. In the absence of all symptoms the patient still shows a negative Wassermann and a positive Hecht-Weinberg-Gradwohl.

CASE 23 (3168).— Service of Dr. Gradwohl. In August, 1913, patient came under observation with a history of syphilis of two years' standing. Had had only six months' treatment by mouth. Showed mucous patch. Gave strong positive Wassermann and Hecht-Weinberg-Gradwohl at the time. He was kept under continuous mercury and salvarsan treatment. Six salvarsans and weekly injections of mercury were given, with proper intervals of tonic treatment for one year. Later he showed negative Wassermann and positive Hecht-Weinberg-Gradwohl. This case has been continued, and only in the past two months has shown negatives in both tests.

CASE 24 (8211).— Service of Dr. Gradwohl. Infection three months ago. Treated with pills. Shows a negative Wassermann and positive Hecht-Weinberg-Gradwohl. At this time the patient is profusely covered with macular syphilids, and also numerous mucous patches in his mouth.

CASE 25 (6453).—Service of Dr. Gradwohl. Shows a negative Wassermann and a positive Hecht-Weinberg-Gradwohl in December, 1915, eight months after initial lesion and after two salvarsans had been given with no other treatment. It is interesting to note that after intravenous injection of salvarsan, January 26, 1916, he showed a Wassermann ++++ and a positive Hecht-Weinberg-Gradwohl ("reactivation").

CASE 26 (8204).—This patient came under observation with a primary sore followed by a secondary eruption. He had had, previous to my observation, three salvarsans, and fifty-six intramuscular injections of mercury. He now presents himself two and a half years after, with chancre recurrens. At this time he shows a negative Wassermann and a positive Hecht-Weinberg-Gradwohl. Under treatment the chancre disappeared, but the reaction persists (May, 1916).

CASE 27 (3634).—This case gives a history of primary sore one year previously. He has no visible indication of syphilis, but complains of dizziness. Examination of blood at this time shows negative Wassermann and positive Hecht-Weinberg-Gradwohl. Has been continued under treatment to relieve his symptoms. Up to date, one year after that he showed strong positive Wassermann and positive Hecht-Weinberg-Gradwohl. This is evidently a "positive-fast" individual.

CASE 28 (5531).— Patient of Dr. Jost. Contracted syphilis twenty-seven years ago. Had treatment for a period of two years with pills; spent three to six weeks at Hot Springs each year up to six years ago. Now complains of a swelling in right testis. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 29 (4992).— Service of Dr. Jost. Husband contracted syphilis six years ago (during his married life). Patient's history negative, no symptoms, no treatment. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 30 (6065).— Service of Dr. Jost. Treatment 0.6 gm. salvarsan intravenously followed by sixty-two injections of sodium cacodylate intravenously, 10 grains each, during a period of four months. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 31 (6064).— Service of Dr. Jost. Came under observation, Oct. 20, 1915. No history, symptoms or treatment. Blood test made to verify showed positive Hecht-Weinberg-Gradwohl given by his child. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 32 (8278).— Service of Dr. Jost. No history, no symptoms, and no treatment. Syphilis papulosa mucosae oris. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 33 (3060).— Service of Dr. Jost. Came under observation, June 18, 1914. Contracted syphilis, June, 1912. Treated with pills for seven months. Spent two and a half weeks at Hot Springs. June 16, 1914, complained of nocturnal headache and loss of weight, and had large syphilitic sore on left leg. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

CASE 34 (4865).— Service of Dr. Jost. Patient came under observation with large ulcerated area on left leg 3 inches below knee. Has had some treatment on and off for past two years. No history. Wassermann negative, Hecht-Weinberg-Gradwohl positive.

COMMENT

The group of cases in which the amount of natural amboceptor in human serums seems to play a definite rôle in making a Wassermann appear negative and a Hecht-Weinberg-Gradwohl positive comprises the following:

1. Cases of ocular syphilis.
2. Cases of visceral syphilis, particularly of the liver and heart.
3. Cases of syphilis that have received intensive but inadequate treatment.
4. Provocative cases in which we are seeking to revive a Wassermann in suspected cases.
5. Cases of monosymptomatic tertiaries.

It is my belief that this test is far superior in every respect to the Wassermann in point of delicacy of "control" of treatment. Heidingsfeld[5] speaks of the superiority of this test in estimating the finest shades of any remaining trace of the disease in cases under treatment, while he maintains that the Wassermann used in this way estimates only the coarse, early improvement. This to my mind expresses exactly my own position based on my experience with the test in cases under treatment. I have noted that the vigorous institution of antisyphilitic treatment, except in the case of the "Wassermann-fast" subject, quickly reduces a positive Wassermann to a negative. Not so with the Hecht-Weinberg-Gradwohl, however. Long after the Wassermann has become negative and the case very properly still held to the specific treatment, this reaction persists. The reduction of the Hecht-Weinberg-Gradwohl from positive to negative under

5. Heidingsfeld: Serology and Diagnosis of Syphilis, New York Med. Jour., April 8, 1916.

treatment is far more significant to me as a proof of successful therapeusis than is the Wassermann. Another observation from my experience with this test which might also be mentioned here is that when the Hecht-Weinberg-Gradwohl becomes negative as a result of the intensive treatment that is needed to bring this about, it seldom lapses back to positiveness. In other words, the Hecht-Weinberg-Gradwohl when negative after being persistently positive in untreated syphilis is the "consummation so devoutly to be wished by the syphilologist." I of course do not wish to go on record as stating this as a proof positive of "cure," but I do insist that it has a greater value when repeatedly negative than has a Wassermann under similar conditions.

CONCLUSION

I wish to state also that the Hecht-Weinberg-Gradwohl in my hands has been a far better check or control of the Wassermann than the use of any of the controls now in vogue. The so-called borderline Wassermann reactions, if truly positives, will show a strong Hecht-Weinberg-Gradwohl. A supposedly borderline positive Wassermann that shows a clearly defined and complete hemolysis in the Hecht-Weinberg-Gradwohl tubes is not a borderline at all; it is a spurious reaction and should be thrown out of consideration. There is no better way to control the accuracy of the Wassermann than the use of this test on every blood submitted for examination. While originally advocating this test, therefore, as a control over the Wassermann, I feel at present that it has attained the dignity of something more than a mere "control" over the classical test. It should take precedence over this test by virtue of its greater accuracy and be accepted as such wherever it is used. Outside of the extra amount of time necessary in making the test, there is no argument against its widespread and continuous use in the serologic laboratory. The extra amount of labor is more than compensated for by the greater amount of information obtainable. I do not recommend it, therefore, solely as a control. Rather do I speak of it as a far better test than the Wassermann except in the 2 per cent. of cases that have no hemolytic index. In this small group the Wassermann must remain our ally. In all other cases we could, indeed, eliminate the Wassermann, and lose nothing by so doing. It is only in deference to those who cling to the Wassermann that I continue to place it ahead of the Hecht-Weinberg-Gradwohl in my reports. To my mind it has long since been passed in the race by the Hecht-Weinberg-Gradwohl, and is bringing up a bad second.

No negative Wassermann test to my mind is worth while unless backed up by a negative Hecht-Weinberg-Gradwohl. When both are negative, which occurs in 25 per cent. of syphilitic cases, according to my statistics, then recourse must be had to the various other methods of the clinic and the laboratory, for the inclusion or exclusion of any remaining trace of the disease.

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ABSTRACT OF DISCUSSION

Dr. M. L. Heidingsfeld, Cincinnati: A year and a half ago I took up the study of the Hecht-Weinberg serologic examination as modified by Dr. Gradwohl, with a great deal of skepticism. I was thoroughly imbued with the idea laid down by Wassermann and his confrères that the Wassermann serologic examination was the test par excellence, that all modifications had certain fallacies that might lead to serious error, and that the Wassermann itself could never err on the unsafe side, namely, we could never have a positive Wassermann and no syphilis present if carefully and consistently carried out. All the modifications, the Noguchi and the Hecht-Weinberg as originally laid down, were regarded by Wassermann and his co-workers as possible pitfalls. I have used the modification as set forth by Dr. Gradwohl for a year and a half, and I can confirm everything he has said. This modification is absolutely trustworthy and reliable. I do not know of a single instance where I have had a positive reaction in which syphilis could be excluded definitely. In this respect, it is as trustworthy as the Wassermann itself. I have always been a strong convert to serologic control. I will admit that there are many who are opposed to that idea. The Wassermann and its modifications have fallen into considerable disrepute, in my judgment a very unfair and unjust disrepute. I believe that the serologic examination as laid down by Wassermann himself, if all the precepts are carefully carried out, the controls properly made, reagents carefully and properly prepared, and the various steps standardized and properly performed, the reaction is absolutely trustworthy and reliable. I can say equally as much for the Hecht-Weinberg. To treat a case of syphilis without a serologic control is very unsatisfactory and unscientific. These controls give us a wealth of information that we otherwise would not have, whether the case is progressing favorably or unfavorably, and how soon the treatment should be repeated, whether or not the same remedy should be used, or a change made to some other remedy, whether or not early marriage can be countenanced or discouraged. The Hecht-Weinberg as modified by Gradwohl gives us more information. Very often cases of syphilis which are strongly positive to the Wassermann become Wassermann negative in thirty to sixty days after salvarsan treatment, but remain positive to the Hecht-Weinberg (Gradwohl), for six months or longer. These cases, therefore, still have latent syphilis from a Hecht-Weinberg (Gradwohl) standpoint, whereas from a Wassermann standpoint, they appear to be clinically and serologically negative. These are the cases that are prone to relapse unless treatment is energetically pushed. Cases which are serologically negative to both the Wassermann and Hecht-Weinberg (Gradwohl) are not so prone to relapse. Exceptionally, they also relapse, if the case is indefinitely withdrawn from treatment and observation. Relapses in this class, however, are the exception, rather than the rule, and if they are controlled by monthly Hecht-Weinberg (Gradwohl) serologic examinations, any tendency to relapse can be recognized early and brought under more prompt control than otherwise. In my experience, I have also often noted a positive Hecht-Weinberg (Gradwohl) and negative Wassermann, but I have never observed a negative Hecht-Weinberg and a positive Wassermann. This in and of itself shows that the Hecht-Weinberg (Gradwohl) modification is a much more sensitive test for syphilis than the Wassermann.

Dr. A. L. Wolbarst, New York: I have had a number of examinations of serum made for me by Dr. Gradwohl with the Hecht-Weinberg modification, not so much as an original test for syphilis, but to check up the results of other laboratories with the Wassermann test. It has been my experience that you can go into any laboratory in this country and take your choice as to whether you are going to get a positive or a negative report on any serum submitted. Some laboratories will give you a positive and some a negative report on the same serum taken at the same time and presented under the same conditions. Serologists are working hard trying to devise some way by which the thirty-five or forty sources of error which have been revealed may be obviated. I was very glad to employ this Hecht-Weinberg test, as modified by Dr. Gradwohl, and to see which of the laboratories I was dealing with furnished the more accurate reports, and I am very gratified to say that, considering the clinical manifestations of the case, the Hecht-Weinberg appears to me, as far as my experience goes, to be far more delicate and far more reliable than the straight Wassermann. In any number of cases where I have had contradictions, positive and negative in the same serum, where I have had a negative Wassermann given to me in a case of undoubted syphilis, the Hecht-Weinberg has been

positive. I have never seen an instance of a negative Hecht-Weinberg with a positive Wassermann. I feel that in any case in which we are in doubt as to whether the Wassermann we are getting is to be depended on, the Hecht-Weinberg-Gradwohl modification gives us an amount of information which is of the greatest importance. It ought to be used more generally than it is.

DR. LELAND BOOGHER, St. Louis: I have no faith in the Wassermann test being infallible. A minus Wassermann does not necessarily mean no syphilis. I always feel safer when I have the two tests made. In all the cases I have had it has been interesting to notice that where there was a negative Wassermann and a positive Hecht-Weinberg, I had made a diagnosis of syphilis. There are many cases where I suspect syphilis and have the tests made, and it is sometimes very satisfactory to find that the diagnosis has been correct. As to the accuracy of the Hecht-Weinberg test, I am only speaking from the standpoint of the clinician, but I have always felt that it was possibly a more delicate test than the Wassermann. I like to have both tests made on my patients.

DR. LEWIS E. SCHMIDT, Chicago: I agree with Dr. Gradwohl and Dr. Heidingsfeld. I wish to cite several instances where the Wassermann was negative two and three years after the last treatment. Under those circumstances we are prone not to give further treatment. In several instances we found the Hecht-Weinberg test positive two or three years after the last negative Wassermann. In other words, during that entire period of time the Wassermann was negative, yet at that late period the Hecht-Weinberg was positive, which set me thinking as to the necessity for further treatment, particularly in this series of cases.

DR. M. L. HEIDINGSFELD, Cincinnati: The Wassermann is also invaluable when used in conjunction with the Hecht-Weinberg (Gradwohl). It reveals the finer shades of early improvement, which the Hecht-Weinberg in and of itself fails to reveal. Moreover, the two controls serve as a check on each other, eliminating, in a measure, any possible error of a purely technical nature. Each serves as a check on the other in this respect. The Hecht-Weinberg is positive, is always strongly positive, never weakly positive as the Wassermann, when it shades off in the stages of early improvement.

DR. CARL C. WARDEN, Ann Arbor, Mich.: There is no question that theoretically and practically the Hecht-Weinberg is an improvement on the Wassermann. The great difficulty lies in two factors, one the complement and the other the antigen. The antigen is the thing. We are extremely unfortunate in the Wassermann reaction. The antigen is very indefinite. It has been classed as a lipoid, but there is no substance in it on which we can really lay our hand. I believe with further studies on the toxicity of normal serum, of the periodic disappearance of the complement in normal serum, and with improvements in the syphilitic antigen, that we will be able to pick up those positive reactions better than we do now.

DR. BENJAMIN GRUSKIN, Chicago: I have used the Hecht-Weinberg test in over 200 cases. I have nothing but praise for it as a control, and still call it a control. The clinician as well as the laboratory man is sometimes at a loss to interpret the so-called borderline cases. Some laboratory men, in a case that gives a slight positive reaction, will say, "I am not going to condemn that man because he gives a very faint positive reaction." Others, again, are very liberal in pronouncing a case syphilis when they see the slightest degree of nonhemolyzed cells. Really, one test is not sufficient in a doubtful case, so any additional control is of great value. I would rely more on a positive Wassermann than on a positive Hecht-Weinberg, and I would rely more on a Hecht-Weinberg negative than I would on a Wassermann negative, but I believe by employing both one can check up and make a standard which can be called "faintly positive" or "strongly positive." What is needed more in laboratory work is to know exactly what "one, two, three or four plus" positive is. What one man will call "one plus" another will ignore altogether. However, the two tests used together by a close observer, who has his own standard for what he calls "one, two or three plus" positive, will certainly be a great aid to the laboratory man as well as to the clinician. Another factor regarding the Hecht-Weinberg which must be taken into consideration is that the serum must be sent to the laboratory immediately. This is hardly possible with a serum that is sent from out of town, which necessarily would be at least a day old. In these cases one may inactivate the serum, as for the Wassermann, and go through with the Hecht-Weinberg in the usual manner, plus additional complement.

DR. R. B. H. GRADWOHL, St. Louis: This is a far easier test to perform than the Wassermann. This test uses no artificial amboceptor and no artificial complement. It requires no guinea-pigs, it requires no injection of rabbits. It requires fourteen tubes, which may look startling, but does not mean very much work. It requires one tenth of a cubic centimeter of the patient's serum in each tube. We then estimate how much complement and amboceptor are present. In this test we do not have to bother very much with what are called borderline Wassermanns. With this test, they are either positive or negative. It is in this respect that this test has been of most value in my hands, because any Wassermann worker will confess that these borderline cases have been our bête noir. Often we could not tell a clinician whether a given case was positive or negative. It was a "borderline." In these instances the Wassermann instead of being a help was a great hindrance. This test eliminates that. If you get a "borderline" Wassermann you will get a strongly positive Hecht-Weinberg; if it is a spurious "borderline" Wassermann case you will get a negative Hecht-Weinberg. If it is worth nothing else, it is worth a great deal to serologists from that standpoint.

CANCER OF THE PROSTATE*

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Cancer of the prostate may be defined as a process of new growth or malignant degeneration of previous growths taking place primarily at any place within the capsule, or within that portion of the urethra which communicates directly with the glandular tissue of the prostate by way of its ducts.

For some reason, unknown and unexplainable with our present knowledge, that glandular group, lying between the submucosal urethral tissues and the posterior capsular surface, the so-called posterior lobe, is, or appears to be, the most frequent site for development of cancer of the prostate. It is claimed by Young and his school that the exceptions to this are very rare. We admit the value of this careful research work, but to us it seems that its conclusions are forced. It is often manifestly impossible to determine, when the disease is widely distributed, exactly which is the oldest part; but we do know that it has been seen primarily in any anatomic portion of the gland, and in atrophied, apparently normal, and hypertrophied prostates. As there is no definite, unvarying and finely marked syndrome characterizing cancer of the prostate, the diagnosis must be determined largely by exclusion. In approaching a prostate suspected of pathologic change, the examiner must keep before him the mental image of the average normal organ: about the size of a horse chestnut and of much the same shape, its upper border concave, convex toward the anus, bilobar, but not always symmetrically so, with a groove perpendicular to its long axis between

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, all of the individual case reports are omitted in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

* This paper and the paper by Drs. Young and Frontz, which follows, are parts of a symposium on the prostate. The remaining papers, by Drs. Gardner, Crenshaw and Squier, and the discussion will appear next week.

these lobes where the tissues are markedly thinner, showing the course of the urethra through the organ; usually rounded from side to side, but not infrequently flattened like a truffle from its lateral abrupt borders toward its center; elastic, relatively smooth, only moderately sensitive to digital pressure, and movable to a degree from side to side and from above downward.

Chronic departures from this type, processes to be diagnosed differentially from cancer, are:

1. Increase in size and density and the presence of hyperesthesia: chronic parenchymatous prostatitis, either total or partial, with groups of hyperplastic glands, oftentimes with capsular adhesions.
2. Long continued, low grade, deep seated abscess of the prostate running its course without the symptoms of frank infection.
3. Primary tuberculosis of the prostate with its massive induration.
4. Stone situated well within the glandular tissue.
5. Atrophy of the glandular tissue with interstitial inflammatory changes.
6. Contracture of the bladder neck.
7. Sarcoma.

Let us see how these differ from, and how, in their symptoms, they resemble cancer of the prostate.

Chronic Parenchymatous Prostatitis.—The exploring finger encounters an obstruction bulging into the rectum from the region of the prostate. This may be symmetrical with a distended capsule, or the inflammatory process may be localized in one or more groups of glands in one lobe, or scattered irregularly throughout the whole organ. Such a prostate is tender on pressure and often very hard. Gentle massage always appreciably alters its consistence, reduces its volume and expresses a succus prostaticus which contains pus, phosphatic debris, lecithin granules, bacteria, epithelial cells of normal shape and staining capacity, and often dead spermatozoa. The mesial groove is still preserved, and a metallic instrument introduced into the bladder can be readily palpated throughout the whole length of the prostatic urethra. Examination of the posterior urethra by a water urethroscope or an open endoscope shows congestion, edema, pus exuding from enlarged glandular ducts, and often cysts and polypoid growths. Increased frequency in urination is often present, and there may be hesitancy and lack of power to the stream, and even residual urine, usually due to the presence of polypi or edema in the posterior urethra. All of the symptoms improve under treatment.

Simple Hypertrophy.—In adenomatous or fibromuscular enlargement of the prostate we palpate through the rectal wall an exaggerated prostate, an organ out of bounds. The enlargement is often symmetrical, but, just as frequently, larger on one side than on the other; it is movable when it can be grasped bimanually; the rectal tissues slide over it, or it slides away from the rectal tissues. There is a certain elasticity approaching the normal to the tumor, or tumors, if the adenomatous elements prevail; any outgrowths beneath the bladder, and up along the seminal ducts are soft and elastic. If there has been much long continued inflammation accompanying the process, and the fibromuscular changes outbalance the glandular, the tumor masses may be indurated, but they are never hard, like sole leather, bone or ivory, and they are not adherent to the surrounding parts. Massage reduces their volume temporarily, and if there has been no infection, expresses a succus prostaticus that contains masses of epithelial cells, undergoing fatty degeneration, abundant lecithin bodies, amorphous calcium phosphates and carbonates, a few leukocytes, many sympexia, and often live spermatozoa. If the patient has advanced to catheter life, infection has almost invariably taken place, and then the microscopic field shows, in addition, pus, bacteria and often a few red blood cells.

The cysto-urethroscope shows a congested, but flexible, posterior urethra with encroaching smooth surfaced whitish adenoma, enlarged follicular ducts, sometimes diverticula, few or many polypi and small cysts. The shaft of the instrument may usually be palpated from the anus to the bladder neck.

Chronic Abscess.—Long continued, low grade, deep seated abscess of the prostate taking its course without fever and without general infection, but with cachexia and deep seated boring pain, may give rise to the mistaken diagnosis of cancer. I had one such case in 1897 in the Los Angeles County Hospital:

> A man, aged 60, had suffered for six months with deep seated pain in the perineum, with increasing difficulty in micturition, and finally complete retention. There were no other symptoms excepting a marked cachexia, constipation and loss of weight. On rectal examination, we found a huge tumor, stone hard and unyielding, occupying the whole pelvic floor. This was believed to be without any doubt, a malignant growth. A perineal exploratory operation was undertaken. Just as the apex of the prostate was opened, there was a gush of pus, and the exploring finger entered a capsular sac, entirely empty of prostatic tissue. This sac surrounded the urethra, which coursed through it, without any communication with it.

Binney reports a somewhat similar case in a much younger man, the exploratory operation being made suprapubically.

Stone in the Prostate.—This need not occasion any diagnostic difficulty, as the Roentgen ray easily differentiates for us.

Prostatic atrophy of the glandular and muscular tissues, with chronic interstitial inflammatory changes, causing loss of elasticity in the prostatic urethra, and contracture of the bladder neck, is often painful and simulates cancer very closely at times. The ring of indurated tissue entirely surrounds the urethra and prevents the shaft of the cystoscope at the neck being plainly felt by the exploring finger. In these cases, the best criterion of the nature of the malady is microscopic slides of the tissues removed by the punch.

Tuberculosis.—The occasions on which an error in diagnosis between cancer of the prostate and tuberculosis are possible should not be many, for tuberculosis is usually seen secondary to a similar affection of one or both epididymides with scattered nodules, of only a moderate degree of induration, and early vesical irritability, or else follows a descending urinary tuberculosis of long standing, tubercle bacilli being present in the urine, with caseating destruction of the prostate, from the urethra out, and ulceration along the urethral channel, demonstrable by the urethroscope, and accompanied by a urethral discharge, usually free of micro-organisms. Once, and once only, in an experience of more than thirty years, have I seen a case of primary tuberculosis of the prostate, in a man of 30 in which, symptomatically and by clinical history, we were dealing with a carcinomatous growth, which on microscopic section and subsequent development, was demonstrated to be tuberculous.

Sarcoma.—This is more elastic and of less painful development, and is more likely to occur in youth, though I have had two cases in men past 50 years of age.

FREQUENCY OF CANCER OF THE PROSTATE

Socin and Burckhardt[1] in 1902 assembled 120 cases, the total material reported in the literature of all languages up to that time. During the past thirteen years it has been learned that cancer of the prostate is relatively common, and in great clinics, where the specimens removed in operating for prostatism have all gone to careful microscopic examination, the following figures have been returned: Reports from the Necker Clinic place the frequency at 15 per cent.; from the Johns Hopkins, at 28 per cent.; the Mayo Clinic, at 15.5 per cent., and Mansell Moullin,[2] at 25 per cent. This gives an average of about 20 per cent., or one case in five, which probably closely approximates the true figure, though the returns of the pathologic institute at Munich are still higher, nearly 40 per cent., or one in two and one half cases, a figure which should cause much thought to an unskilled operator. The youngest patient who has come to my notice was 17 years of age, reported by Gardner and Cummings.[3] A number of cases have been recorded in persons past 80.

CARCINOMA

In the analysis of the appended cases, it will be easily seen that extensive carcinomatous infiltration of the prostate may exist without the presence of any of the symptoms commonly relied on to make a differential diagnosis between this condition and prostatic hypertrophy, for vesical retention and irritation is common to the two. There is no change in the urine that may be relied on as significant of cancer of the prostate. Judd[4] seems to think that an unusually low specific gravity is found in these cases; but this is true of any chronic obstructive disease of the total urinary tract, and bears no relation to cancer. How much more difficult must it be to determine an accurate diagnosis when the whole process is entirely intracapsular and confined to a deeply situated glandular group well removed from both the urethral and the rectal zones. When retention supervenes on vesical irritation, in months instead of years, after difficult and painful urination, mostly at night; when infiltration bullet-like, boardlike, leather-like or ivory-like is found in the prostate of a man who presents no symptoms of active syphilis or tuberculosis, and whose blood gives a negative Wassermann reaction; when the capsule of the gland has become adherent to the anterior pelvic fascia, or the fascia of Denonvillier, and the perirectal fascia, but the rectal tissues are no longer movable on it, and it has lost its motility in the pelvis, and the prostatic image to the sense of touch has become blended with that of one or both of the seminal vesicles, without the presence of acute inflammatory symptoms; when the central groove is blurred or lost, in the anterior two thirds of the prostate to the finger examining through the rectum over a steel instrument in the urethra; and added to this is loss of strength, and pain in the back, pain in the rectum, edema of the lower extremities, and neuralgia along the course of the sciatic, obturator or crural nerves, it is safe to make the diagnosis of cancer of the prostate.

The stiffening of the walls of the posterior urethra gives to the introduction of the instrument to the bladder a peculiar resistance which is not that of the blocking caused by adenomatous nodules, but more of insufficiency of tubular space. It is not unusual for a metallic or silk catheter or a cystoscope to creak in its passage through the narrowed and stiffened urethra, as if it were passing unoiled through a tube of harness leather. An inlying catheter is never well borne. Hematuria may or may not be present. It always occurs early when the cancer starts in the prostatic urethra. I have met two cases of this character recognized by means of the urethroscope. In both the prostate was easily enucleated entire; there were no adhesions and no nests in the peripheral tissues. Both had prompt local recurrence and metastasis, and each patient died within six months. Hematuria is much more likely to occur in a congested hypertrophied prostate, but its origin should always be investigated with a cystoscope of small size of the irrigating type which will get by almost any obstruction in the posterior urethra if the stream of salt solution is turned on when the instrument is passing through the bulb.

A urethroscopic examination of the posterior urethra should always be made when cancer of the prostate is suspected, as pointed out by Braasch.[5] If the disease is on the anterior wall, it can be seen as shown in Case 3 of my appended report; if in the posterior lobe, the floor is elevated so that the sulcus, posterior to the colliculus, is wholly obliterated. Bullous edema of the bladder neck or trigon is frequently observed. The size of the prostate is no argument for or against its malignancy. Small, hard, painful prostates, occurring in men in the fifth and sixth decades of life, should always be viewed with suspicion, as should also abnormal tenderness or pain in the rectum without the presence of hemorrhoids or inflammatory affections of the rectal walls or of the prostate. Metastases often take place early to the lymphatics and the bones in men past the age of 45. Without a clear picture of lymphocytosis, pernicious anemia, Hodgkin's disease, tuberculosis, local infection or syphilis, any chronic swelling of the lymph glands, or persistent ostalgia should cause investigation of the prostate for cancer.

Edema occurring about the penis, the rectum or the lower extremities, without definite renal or cardiac pathology, should always make one thoughtful of a probable carcinoma of the pelvic organs; and if, in the male, it be accompanied by pelvic pain and vesical irritability, should be sufficient cause to incite examination of the prostate for a primary cancer causing metastasis to the pelvic lymph glands and pressure on the iliac veins.

Metastasis takes place at times undoubtedly while the disease process is confined within the capsular wall; but it is usual after the rupture of the capsule, an occurrence signaled by the cessation of nerve pressure and the sudden temporary relief from pain, for it to spread, especially when the origin is in the posterior lobe, to the seminal vesicles and the pelvis, the bladder being attacked nearly always late and through the posterior wall close to the ureteral mouths, where it is in contact with the loose cellular packing about the seminal vesicles. This extension takes place along

1. Socin and Burckhardt: Die Verletzungen und Krankheiten der Prostata, Deutsche Chirurgie, Lieferung 53, Stuttgart, 1902.
2. Moullin, M.: Early Diagnosis of Cancer of the Prostate, Brit. Med. Jour., May, 1909.
3. Gardner and Cummings: Prostatic Carcinoma in a Youth, California State Jour. Med., July, 1914, p. 279.
4. Judd: Cancer of the Prostate, Surg., Gynec. and Obst., March, 1915.
5. Braasch: Factors Which Determine the Advisability of Prostatectomy, St. Paul Med. Jour., January, 1915.

the ejaculatory ducts and the accompanying lymph channels, as was first pointed out by Young.[6]

Lundsgaard[7] reports a huge extensive lymphoma of the neck, operated on and found to be adenocarcinoma, in which, postmortem, a chain of fibroplastic carcinomatous enlarged glands led directly to a left-sided cancer of the prostate, in which the adenocarcinomatous parts lay in nests separated from each other by thick layers of fibromuscular tissue which had given no local symptoms during the patient's life time.

According to Salinger,[8] cases of metastases have been observed in all of the gland groups of the head, neck and trunk, including the axillary. I have seen metastatic nodules in the liver and in the splenic flexure of the colon from the prostate; others have found them in the suprarenal capsule, kidneys, spleen and pleura. Von Recklinghausen first directed attention to the great frequency of secondary cancer in the bones, metastatic from the prostate, and this has become so much a matter of common knowledge with surgeons that it may be accepted as a rule, that no case of apparent primary carcinoma of a bone, in a man past middle life, should be operated on without investigation of the prostate gland, so as to avoid unnecessary surgery. Yet sometimes the primary nodule in the prostate is so small and deeply placed that it is only discovered postmortem.

When the patient comes for consultation with bloody foul-smelling urine and dysuria, terrifying tenesmus, or entire retention, with great difficulty in passing a catheter through the urethra and great resentfulness to its presence there, so that it can be retained for only short intervals, or not at all, with pains radiating out from the pelvis in all directions, with edema of the legs and perineum and a stone hard immovable prostate, tender to the touch, not to be differentiated from the surrounding pelvic organs, and enlarged superficial inguinal glands, the diagnosis of cancer of the prostate is easy but useless to make, for it is long past the time at which any valuable relief can be given to the patient.

When is the time for diagnosis of cancer of the prostate, and what are the means to attempt its cure or relief? The time is while the growth of the carcinoma is still confined within the capsular walls of the gland; while we are not yet certain of its nature; while there is yet a chance that the growth may be one of the conditions from which we have to differentiate it. The means are the surgical procedure of prostatectomy with complete removal of all the glandular elements, either after the method of Freyer, or that of Young. The two give equally good results if performed properly. Freyer reports eight cases in which the patients were alive and in good health, from three to ten years after operation, and others in which the results were not so good; but he states that, even though the disease should recur, it is a great consideration to the patient in the interval to be able to urinate normally, thus deferring for months, or even years, the establishment of a permanent fistula.

Taking the figures of Albarran and Halle[9] as a basis, in which fourteen out of 100 prostates, apparently normal on removal, proved microscopically malignant, he believes he has operated on 150 carcinomatous prostates in this stage, and he has not known of more than six in which cancer subsequently affected the patient. Given that this stage has passed and the cancer is not surmised, but the diagnosis reasonably certainly established, what is the best mode of procedure? The choice then has to be made between as complete enucleation, or dissection, as possible, conducted suprapubically, so as to run no risk of incontinence by destruction of the external sphincter, and subsequent sparking of the capsular fragments with the d'Arsonval current, as I have shown to be feasible and successful, in Cases 5, 6 and 7 of this report; or by the operation described by Young as a conservative partial prostatectomy, removing all the prostatic tissue that can be removed by a dissection on each side, and outside of the urethra, but within the capsule, to delay progress and give for a time relief from retention. The ease with which such dissection can be accomplished will depend much on the cancer type. These prostates are usually not very large, and if of the epitheliomatous type, they adhere to the capsule and present the same difficulties to removal that small prostates of the fibroid type do, while adenocarcinoma often separates easily from the capsule. In rare selected cases, one may attempt total removal of the prostate and its capsule with the urethra beyond the triangular ligament, and the anterior two thirds of the trigon, either by the method described by Young, or by the method described by me. As Young advises, such an operation should not be commenced if the trigon is infiltrated, the pelvic or iliac glands enlarged, the seminal vesicles, the membranous urethra, or the muscular wall of the rectum involved, or metastatic foci are known to exist. The partial removal of a cancerous prostate, through the perineum, will result in incontinence in 50 per cent. of the cases; but if a good free channel is obtained, the patient will live much longer and be much more comfortable, even if he does have to carry a urinal, if he cares for that kind of life. I had one patient who lived for seven years, and he seemed to be happy. Naturally, in some cases, interference with the knife would cause more rapid spread of the disease and should always be followed by a thorough sparking of the remaining parts with the bipolar high frequency current.

When it does not seem wise to undertake any of these measures, or they are rejected, catheter life is the refuge as long as it is not painful or very difficult to pass a catheter. When the patient becomes unhappy from pain, or infection supervenes, or recurrent epididymitis occurs, permanent drainage through a suprapubic fistula must be established. For this purpose, many apparatus have been devised, the major number of which are cumbersome and unsatisfactory. I think I have tried all that have been recommended in the past thirty years; each leaks at times, some, all of the time. The cheapest and most satisfactory I have found to be a De Pezzer self-retaining catheter from 20 to 30 in caliber of the French scale, which is to be connected with a glass or metal bottle, carried in a special pocket in the underwear during the day and with a small hot water bag attached to the undershirt at night. The bladder can be washed of débris through this tube once or twice a day, with a silver nitrate mercuric cyanid or permanganate solution. The tube has to be replaced in from three to six months. These

6. Young, Hugh: Cancer of the Prostate, Ann. Surg., December, 1909; Perineal Prostatectomy for Cancer, ibid., 1910; Carcinoma of the Prostate, Keen's Surgery, **6**, 690.
7. Lundsgaard, C.: Metastasierendes Prostatakarzinom, Lymphomatosis simulierend, Virchows Arch. f. path. Anat., 1913, **213**, No. 1.
8. Salinger, J. F.: Beitrage zur Symptomatologie und Diagnose d. Prostatacarcinom, mit besonderer Berücksichtigung der früh. Diagnos.
9. Albarran and Halle: Hypertrophie et néoplasie épitheliales de la prostate, Ann. d. mal. d. org. genito-urin., 1898.

TABULATION OF CASE REPORTS

Case	Date	Physician	Age	Dysuria	Palpation Through Rectum	Cystoscopic Information	Kidney Function	Operation	Complications	Origin	Results	Alive	Metastases
1	11/13	E. J. Boeshe.	76	3 months.....	Some thickening over shaft of cystoscope	Congested bladder...	Phthalein, intravenous, 11 min.; 32%	Suprapubic prostatectomy	Hemorrhage.....	Not clear.....	Comfortable one year; ultimate retention	Yes.	Sacral and lumbar vertebrae
2	11/13	MacGowan....	63	With retention 3 months	Negative as to cancer.	Negative	Phthalein, intravenous, 7 min.; 45% first hour	Suprapubic prostatectomy and d'Arsonval sparking	Hemorrhage.....	Acini; right lobe	Comfortable one year	Yes.	Sacral vertebrae
3	12/13	Hamman.....	69	With retention 9 months	Negative as to cancer.	Vesical outlet changed; growths in urethra visible	Urea, Marshall test, normal	Suprapubic conservative prostatotomy	None.....	Superior lobe injury, silver catheter	Comfortable six months; no return of retention	Died 9/15	Lumbar and sacral vertebrae
4	5/14	Dohman.....	70	10 years; with retention 5 months	Hypertrophy; negative as to cancer	Distortion of vesical outlet	Markedly uremic; phthalein, 17 min.; 20% first hour	Suprapubic prostatectomy in two stages	None.....	Acinus, anterior lobe	Perfect in every way	Yes.	None
5	8/14	Stockwell.....	76	4 months.....	Hypertrophy; negative as to cancer	Distortion of vesical outlet; cystitis; follicular abscesses in posterior urethra	Phthalein, intravenous, 4 min.; 58% first hour; urea, 18 for 24 hours	Suprapubic prostatectomy; d'Arsonval sparking	Stricture of urethra; colon bacillus and aureus infection	Apparently anterior lobe injury, silver catheter	Perfect in every way	Yes.	None
6	10/14	Schnabel.....	76	6 months.....	Prostate very hard; right vesicle indurated; mesial groove normal to neck of bladder	Impossible to introduce cystoscope into bladder	Very uremic; phthalein, intravenous, 20 min.; 18% first hour	Suprapubic cystotomy; drainage 5 weeks; prostatectomy; d'Arsonval sparking	Multiple calculi; stricture of urethra; cancer colon	Not clear, wide spread	Perfect as to urination	Yes.	Splenic flexure of colon, liver, pelvic bones, pelvic glands
7	1/15	Morrison.....	63	6 months.....	Prostate very hard..	Trabecular bladder; bullous edema	Phthalein, 47% first hour; urea normal	Suprapubic prostatectomy; d'Arsonval sparking	None.....	Not clear.....	Perfect as to urination and sexual power	Yes.	None
8	5/15	Violet.....	65	6 months.....	Negative as to cancer.	Edema of trigon.....	Phthalein, intravenous, 5 min.; 35% first hour; urea normal	Punch operation; continuous suprapubic drainage	Colon bacillus infection	Near vesical neck	Strong, able to work; process retarded	Yes.	Not certain

patients live from three months to seven years, and often during the early period lose all pain, put on flesh and gain strength, so that to the ordinary observer they appear to be in robust health. In time, the process extending to the bladder mucosa brings ulceration with nerve exposure and hemorrhage, pain, cachexia, the necessity for opium, uremia from ureteral obstruction, and finally death.

Radium Cure.—There is but one authenticated case of apparent perfect cure of cancer of the prostate by radium cross-firing, so far as I know, and that is the one of Pasteau and Degrais.[10] The prostatic urethra is an ideal place for the use of radium, but the results so far obtained do not warrant its recommendation as a therapeutic agent.

Some instances of what appear to be secondary carcinoma of the prostate are on record in which the distributing focus was the colon. I have never met such a case, though I have seen one in which cancer of the descending colon and cancer of the prostate appeared to have developed simultaneously.

Pathogenesis.—Where it is so manifestly difficult macroscopically to differentiate cancer of the prostate, it is easy to understand how dissension has arisen among pathologists as to the pathogenesis of these growths, and the interpretation of microscopic sections made from them. In borderline cases it is very difficult at times to decide without viewing many sections in series. When we remember that "a normal acinus is lined with a single or an imperfect double layer of columnar epithelial cells," we have the basis from which we have to calculate our changes. Given an abnormal stimulus, a hyperplasia of these cells occurs, and so long as the hyperplasia gives rise to types of cells conforming to those naturally existing in the acini and confined to the acini, producing lawful and regularly arranged progeny of the original cells, no malignant type can be said to exist; but when the hyperplasia is chiefly or exclusively of the undifferentiated cells of the outer row, marked, and their arrangement without alinement in relation to one another and to the basement membrane, lawless, the case is probably malignant, and if the stroma surrounding the acinus is invaded by the epithelial cells, surely so.

REPORT OF EIGHT OPERATIVE CASES

I have arranged these cases in tabulated form, giving the ages, previous symptoms, duration, results of rectal and cystoscopic examinations, kidney function, character of operation performed, results obtained, complications and the apparent primary seat of the growth.

Five of these patients were over and three of them were under 70 years of age.

The one constant symptom was dysuria, which had been noticed in two cases for three months, in one for four months, in three for six months, in one for nine months, and in one for ten years. In five (Cases 2, 3, 4, 5 and 8) the results of palpation made through the rectum over the shaft of the cystoscope were negative as to the presence of cancer. In Case 1 there was some thickening in the posterior lobe. In Case 6 the mesial groove could be palpated readily but the rest of the prostate was very hard. In Case 8 the prostate was very noticeably hard over the shaft of the cystoscope. Seven patients are still alive.

10. Pasteau and Degrais: Sur l'emploi du radium dans le traitement des cancers de la prostate, Jour. d'urol. méd. et. chir., Sept. 15, 1913.

Patient 1 was comfortable for a year but now has dysuria and retention from extension of the growth to the surrounding structures and metastasis. Patient 2 was comfortable for a year but now has dysuria. Patient 3 was comfortable for six months but died in September, 1915, never having had a return of his retention. Patient 4 is alive and in perfect health. Patient 5 is in apparently perfect health and has full control of his bladder; there is no evidence either by palpation or by the cysto-urethroscope of cancer in the prostatic cavity or in the bladder. Patient 6 has widespread metastases but urinates perfectly. Patient 7 is apparently well. Patient 8 is alive and comfortable, but wears a suprapubic drainage tube because of the presence of cancer in the bladder wall.

PRELIMINARY TREATMENT FOR PROSTATECTOMY IN UNFAVORABLE CASES*

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Twenty years ago the mortality for prostatectomy was estimated at 20 per cent. Today in some clinics, it is less than 4 per cent. What has brought about this marvelous change? More accurate diagnosis and better operative technic have, of course, done much to reduce the mortality — the substitution of accurate operations, under visual control, for destructive procedures done in the dark, being one of the principal factors.

But much of the early mortality was due to complications, resulting from conditions existing before operation which were overlooked or neglected. In 1898, one of us operated on a patient who came to the hospital in severe uremia. A catheter could not be passed, suprapubic drainage was all that could be done, and the drainage afforded worked a seeming miracle. In a few days consciousness returned, and within a few weeks prostatectomy was carried out without difficulty and with success. Since then we have had a keen realization of the wonderful benefits of preoperative drainage in all prostatic cases in which the kidneys have been impaired by long-standing back pressure.

At first we employed suprapubic drainage in all such cases; but before long we came to realize that the same result could be accomplished by an inlying catheter or even by intermittent, regular catheterization. One of the most striking of these early patients was a man, aged 76, who was comatose and very septic; catheter drainage and infusion were not sufficient to abate his uremia, so we employed blood letting and simultaneous saline transfusion in the opposite arm, together with salt by rectum. After carrying out these strenuous methods for several days, the infection and uremia both disappeared, and in six weeks a prostatic operation was successfully carried out.

Employing the knowledge gained from similar experiences, we were the first to advocate systematic preparatory treatment in prostatic work where involvement of the kidneys, heart, etc., was present, and as a result in 1908 were able to report 128 consecutive perineal prostatectomies without a death, two of the patients being over 80 years and forty-three over 70 years of age.

In the early years of this work, the physical condition of the patient, presence of high residual urine and evident symptoms and signs of poor kidneys were the principal indexes which guided us in our decision as to when to delay operation and to resort to preparatory treatment. The phlorizin test and freezing point were experimented with without much help. When the value of phenolsulphonephthalein was first shown in the urologic department in 1910, it was quickly applied to prostatic cases and found to give the index of renal impairment which we had previously been able only to surmise or guess at.

As time went on, the desirability and value of additional tests for the blood, heart, etc., have been demonstrated, so that now a complex but remarkably helpful series of routine tests are employed in almost all cases.

Too great care cannot be exercised in the study of these cases preliminary to operation. Abnormalities of one kind or another are the rule rather than the exception, and the surgeon who disregards or overlooks these danger signals fails to reduce his mortality to the minimum. A careful physical examination, which should include a blood pressure reading, is of course essential in every surgical case. Of special importance in prostatic hypertrophy is an examination of the urine, the determination of the residual urine and a study of the renal function.

If on examination no organic disease is demonstrable, the blood pressure normal, the urine free from pathologic elements and the renal function satisfactory, an early operation can be carried out with the realization that, from a clinical standpoint, the patient is an excellent surgical risk. There is one important exception, however, which should be emphasized. The presence of a large residual urine, even though there be no infection and the renal function fair, furnishes a considerable risk if operation be performed without preparatory treatment. These are patients often with atonic bladders, dilated ureters and varying grades of hydronephrosis, and without preliminary catheterization, the danger of acute uremia and ascending infection is greatly increased.

Unfortunately an ideal physical condition is the exception, and the risks may be classified as follows:

I. CASES WITH RENAL IMPAIRMENT

This is most often due to back pressure, which usually leads to distention of the renal pelves and thinning of the renal cortex, the degree of lesion being dependent on extent and duration of the back pressure. In many cases infection has been added to the renal lesion, producing varying grades of pyelitis, pyelonephritis and pyonephrosis. In some cases a chronic nephritis is present without demonstrable infection.

Renal impairment may also result from cardiac insufficiency. To determine this renal impairment our most valuable means is:

A. *The Phenolsulphonephthalein Test.*—Space in THE JOURNAL does not permit any extensive description. Our routine is to make one test on admission, if possible with the first catheterization, as important functional changes may occur immediately after that. If the residual urine is large we may expect a drop in

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* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the section and in the author's reprints.

the kidney function until the kidneys adjust themselves to a catheter life (absence of back pressure). Semiweekly phenolsulphonephthalein tests are taken, and as a rule a steady improvement is shown (see cases) until a stationary period is arrived at.

If the first phenolsulphonephthalein test is good, the amount of residual urine not great (say, not over 200 c.c.), and the general condition good, operation is usually not delayed.

If the phenolsulphonephthalein test is poor (appearance time over fifteen minutes, excretion first hour under 30 per cent.), the patient is put on preliminary treatment while further studies are made.

B. *Blood Urea.*—This is determined in cases with poor phenolsulphonephthalein excretion, and in most of these cases shows no abnormal increase of the urea in the blood. In such cases catheter drainage with relief of back pressure will usually result in rapid improvement, as shown by successive phenolsulphonephthalein tests. A high blood urea generally goes with a bad phenolsulphonephthalein test and shows a dangerous condition, though this, too, often rapidly disappears on preliminary treatment (catheter, water, etc.).

C. *Acidosis.*—In cases of impending uremia a marked retention of acid salts may be present in the blood. This is discovered by determination of the hydrogen ion concentration of the blood or by estimation of the carbon dioxid content of the alveolar air. A fair index to the condition may be seen in the amount of sodium bicarbonate required to make the urine alkaline. In the normal person 10 gm. will render urine alkaline in a few hours.

Preliminary Treatment.—This may be classified as follows:

(*a*) Relief of Urinary Retention: This is very desirable when the residual urine is large in amount (over 250 c.c.) even though the phenolsulphonephthalein test is good. In such cases catheterization twice daily for a few days may be all that is necessary. If the phenolsulphonephthalein test is still good and the general condition good, and the infection present is not acute (no dysuria, acute urethritis, epididymitis or suggestion of ascending infection, fever, etc., present) prostatectomy may usually be then carried out safely. In cases with sterile urine, acute infection is to be guarded against by irrigations and injection of small amounts of 5 per cent. argyrol at each catheterization. If, notwithstanding every precaution, infection does occur, the patient should be watched several days to see that the above mentioned complications do not occur.

Where the residual urine is very large (say, over 400 c.c.), and particularly when the phenolsulphonephthalein test shows definite renal impairment, catheterization from four to six times daily is indicated to prevent recurrence of back pressure, and allow the kidneys to improve. In such cases an inlying or retained catheter may be preferable, particularly if catheterization is difficult or quite painful. The catheter should be changed at intervals of from one to three days (depending on infection and irritation), and the urethra should be injected with 5 per cent. argyrol and "rested" several hours before a new catheter is inserted. A small soft rubber catheter is preferable to a gum coudé, but sometimes will not pass. The inlying catheter may be closed with a clip or cork and emptied at intervals, or allowed to drain in a bottle, the patient being up and outdoors if possible. In very acute urethritis and epididymitis a retained catheter should not be employed. Epididymotomy may be required, and intermittent catheterization until acute symptoms subside. Sometimes suprapubic drainage is indicated in such cases, but our experience shows that it is certainly not indicated as a routine procedure, and that even patients with severe renal impairment from prostatic back pressure can almost always be got in excellent condition for prostatectomy by catheter drainage.

(*b*) Diuresis: The use of water in large amounts is very important, to keep kidneys active, expel uremic products, keep down infection and irritation, and assist in restoring good renal function. We give usually 6 ounces every hour, 3 quarts daily, especially in cases with lowered renal function. In severe cases salt solution by rectum or by infusion is employed — often several quarts daily — with due regard to the heart. In severe cases of uremia, transfusion and even simultaneous bloodletting have been employed with almost marvelous effect.

(*c*) Urinary Antiseptics: Hexamethylenamin is given in doses of 15 grains three or four times daily, unless it causes irritation of bladder or gastric disturbance. In alkaline urines, acid sodium phosphate or sodium benzoate in large doses (at separate times from hexamethylenamin) is also given. In cases of dysuria, methylene blue (1 grain three times a day) may relieve the irritation, though diuresis and argyrol injections usually suffice.

(*d*) Treatment of Acidosis: In the acidosis accompanying the severer forms of renal destruction, sodium bicarbonate should be given in large doses until the urine becomes definitely alkaline. This may be given by mouth or by rectum, but in the advanced cases the best results follow its use intravenously. Glucose and lactose, the former by infusion, the latter by rectum, also form a valuable adjunct in the treatment of these cases. In these cases and others showing cumulative phenomena, free catharsis is often followed by most beneficial results.

As illustrating the splendid improvement in these renal types following the institution of preparatory treatment, these cases are cited:

CASE 1.—A. L. R., man, aged 50, was admitted April 14, 1915. There had been obstruction of urination of two years' duration, due to hypertrophied prostate of considerable size. Residual urine was 850 c.c. Phenolsulphonephthalein test: appearance time, twenty-five minutes; first hour, 8 per cent. Blood urea was 1.06 per liter (normal, 0.5 gm.) Mitral insufficiency; blood pressure, 210. Preparatory treatment was instituted. Remarkable improvement was obtained, as shown in the tabulation.

TABLE 1.—PHENOLSULPHONEPHTHALEIN TESTS, BLOOD UREA DETERMINATIONS AND BLOOD PRESSURE READINGS IN CASE 1

Date	Appearance Time Min.	First Hour %	Second Hour %	Total %	Blood Urea Gm.	Blood Pressure
Apr. 6	..	..	..	..	....	210/110
Apr. 8	26	8	6	14	1.06	185/105
Apr. 10	18	12	10	22	....	160/98
Apr. 12	20	14	11	25	0.80	170/85
Apr. 15	19	18	15	33	0.64	
Apr. 24	15	24	11	35	0.55	150/80
Apr. 29	13	23	12	35	0.47	

The patient was operated on the following day, a perineal prostatectomy being done. The convalescence was uneventful and he left the hospital in excellent condition twenty days later.

CASE 2.—E. C. W., man, aged 47, admitted Sept. 30, 1915, with symptoms of urinary obstruction of several years' duration, had nocturnal incontinence. He was toxic, with marked edema. The prostate was very large. Residual urine was 1,125 c.c.; specific gravity, 1.004. No phenolsulphonephthalein during first hour. Blood urea 1 gm. per liter. Preparatory treatment was followed by wonderful improvement (Table 2).

TABLE 2.—PHENOLSULPHONEPHTHALEIN TESTS IN CASE 2

Date	Appearance Time Min.	First Hour Per Cent.	Second Hour Per Cent.	Total Per Cent.
Sept. 30	..	0	13	13
Oct. 2	14	14	25	39
Oct. 6	10	12	22	34
Oct. 10	10	27	19	46
Oct. 15	10	28	16	44
Oct. 17	10	20	20	40
Oct. 19	10	28	20	48
Oct. 24	10	40	19	59
Oct. 26	10	37	21	58

The improvement in this case was very striking, the patient gaining daily in strength and putting on 25 pounds in weight during the four weeks' preliminary to operation. Perineal prostatectomy was performed, October 27. Recovery was uneventful. Patient was discharged well in thirty days.

Comment.—These two cases showed a marked improvement following the institution of preparatory treatment. The first case is one of chronic nephritis with hypertension complicated by infection and back pressure, and shows a gradual increase in the phenolsulphonephthalein output to a point at which it remained stationary. The inverse parallelism between the phenolsulphonephthalein and the blood urea is also well illustrated. We have noted not infrequently in such cases a marked lowering of the blood pressure following the establishment of free urinary drainage and rest in bed. This is rather strikingly shown in this case. The second case is apparently one of functional impairment due entirely to back pressure, and shows splendidly the recuperative power of the kidney following catheter drainage, the renal function gradually returning to normal.

II. CASES WITH CARDIAC LESIONS

The determination of the cardiac risk often involves careful and prolonged study. Valvular and myocardial change is often seen in these cases, but so long as the condition is fully compensated, the risk of operation is minimal. Where there are signs and symptoms of a break in cardiac compensation, however, operation is absolutely contraindicated and should not be considered until complete restoration of function has been established. In these cases, frequent physical examinations, blood pressure records, fluid and urine charts and in the more obscure forms, electrocardiographic studies, are valuable in following the course of the condition.

The treatment of a break in compensation, whether it is due to valvular or to myocardial disease, is much the same. Rest in bed, digitalis and, in cases in which edema is a prominent feature, limitation of the fluid intake and free catharsis are indicated. The surgeon acts wisely in following the advice of a medical consultant in these cases, and at the Brady Urological Institute there is a whole time medical man who has charge of all such cases and the borderline work between medicine and urology.

The following cases show the value of preliminary treatment in this type of risk:

CASE 3.—W. H. H., aged 67, admitted Oct. 21, 1913, had prostatic hypertrophy. Residual urine was 500 c.c. Heart was enlarged, irregular, mitral insufficiency. Electrocardiogram showed marked hypertrophy of left ventricle. Auricles had ceased coordinate contractions and were in a state of fibrillation. Blood pressure was 130. Treatment consisted of large doses of digitalis, rest in bed, catheterization, etc. The improvement in heart was steady and in one month the condition was vastly changed.

TABLE 3.—PHENOLSULPHONEPHTHALEIN TESTS IN CASE 3

Date	Appearance Time Min.	First Hour Per Cent.	Second Hour Per Cent.	Total Per Cent.
Oct. 22, 1913	11	30	8	38
Oct. 29, 1913	10	45	13	58
Nov. 4, 1913	8	40	15	55
Nov. 20, 1913	9	48	12	60

November 21, perineal prostatectomy was performed. Electrocardiographic tracings taken during operation showed only an occasional extrasystole. Three days after operation, the pulse again became rapid and irregular, responding promptly to digitalis. There was no further irregularity, and the patient was discharged, December 13. An electrocardiogram taken December 20, one week after discharge, showed that the heart was contracting in normal manner. There was also great improvement in general health and strength.

CASE 4.—A. B., aged 66, admitted, Dec. 1, 1915, had prostatic obstruction for three years, associated with headaches, dizziness, dyspnea, cardiac palpitation and angina. The pulse was weak, cyanotic and dyspneic; the heart was enlarged greatly. Presystolic gallop rhythm and systolic blow at apex and base. Blood pressure, 165/80. Prostate considerably enlarged. Residual urine, 120 c.c.; specific gravity, 1.016; albumin, pus and bacilli.

TABLE 4.—PHENOLSULPHONEPHTHALEIN TESTS IN CASE 4

Date	Appearance Time Min.	First Hour Per Cent.	Second Hour Per Cent.	Total Per Cent.	Blood Pressure
Dec. 2, 1915	15	16	23	39	160/85
Dec. 5, 1915	10	39	19	58	165/95
Dec. 7, 1915	10	40	21	61	140/80
Dec. 12, 1915	10	40	18	58	

In addition to the catheter drainage, the preparatory treatment in the case consisted chiefly of digitalis and nitroglycerin for the anginoid attacks. The heart compensated promptly, and perineal prostatectomy was successfully carried out, December 13.

Comment.—These two cases illustrate a rather extreme type of cardiac risk, and it is doubtful whether an immediate operation could have been performed successfully. With the return of cardiac compensation, however, the risk was relatively slight, and both patients went through operation remarkably well. The blood pressure raising effect of nitrous oxid rather contraindicates its use in these cases, and we are of the opinion that ether is the anesthetic of choice in such cases, but in other cases we almost invariably employ nitrous oxid and oxygen, with a small amount of ether.

III. CASES WITH CARDIORENAL DISEASE

The study of cardiorenal disease resolves itself into a determination of the relative responsibility of the heart or kidney for the clinical and laboratory findings. As has been pointed out, in pure cardiac disease, the impairment of renal function may be the result of passive congestion, and if compensation is established, the renal function returns to normal. In these cases, in which the cardiac disease is alone at fault, the phenolsulphonephthalein output is rarely alarmingly low, nor is the retention of urea much above the upper limits of normal. Where the burden of responsibility rests with the kidney, however, its functional value, as determined by phenolsulphonephthalein, may approach zero and the urea retention may be at a very high level. Marked improvement as regards the renal and cardiac condition may follow promptly the institution of

catheter drainage and other preliminary measures. In such a case the affair is largely a functional one, the renal impairment resulting from urinary obstruction, the cardiac condition being secondary to the renal one.

In other cases giving little or no evidence of urinary retention, where the elements of back pressure and infection can be eliminated, changes in renal function fail to keep pace with cardiac improvement, and the condition is one of true nephritis.

Many combinations are, therefore, possible; in one instance, the heart alone may be responsible, the improvement in both the heart and kidney running parallel; in another the renal condition is primary, the degree of response to treatment depending on the character and extent of the renal lesion.

The question to decide in the treatment of these cases is the factor primarily responsible for the condition. If the cardiac disease is primary, rest in bed, courses of digitalis and, in some cases, limitation of the fluid intake may bring about a prompt return of compensation. In the cases in which the preponderance of fault lies with the kidney, the establishment of free urinary drainage, diuresis, regulation of the diet, and, in the event of urea retention, free catharsis may be of benefit.

There will remain, however, a certain number of cases in which the outlook is most discouraging and the treatment long and tedious. The forcing of water, so essential a part of the treatment in certain renal types, may be contraindicated by the cardiac condition; and in others, measures directed toward the relief of the heart may be antagonistic to renal improvement.

As an example of a rather extreme type of cardiorenal risk, and as showing how prolonged the preparatory treatment may be, the following case is cited:

CASE 5.—H. D. C., aged 67, admitted Sept. 16, 1913, had prostatic obstruction ten years, attacks of dyspnea, dizziness, headaches, nausea and vomiting, one year, paradoxical incontinence one month, and chronic bronchitis, dilated hypertrophied heart, mitral and aortic insufficiency. Blood pressure was 175; residual urine, 825 c.c.; albumin, casts, pus and bacilli.

TABLE 5.—PHENOLSULPHONEPHTHALEIN TESTS AND BLOOD UREA DETERMINATIONS IN CASE 5

Date	Appearance Time Min.	First Hour Per Cent.	Second Hour Per Cent.	Total Per Cent.	Blood Urea Gm. per Liter
Sept. 16, 1913....	40	10	5	15	0.820
Sept. 18, 1913....	40	15	5	20	
Sept. 21, 1913....	..	5	3	8	
Sept. 23, 1913....	..	..	..	..	0.980
Oct. 8, 1913....	58	3	7	10	
Oct. 16, 1913....	70	Trace	10	10	
Oct. 31, 1913....	60	9	9	18	
Nov. 10, 1913....	30	7	2	9	
Nov. 20, 1913....	.	..	..	..	0.800
Nov. 29, 1913....	..	4	7	11	
Dec. 10, 1913....	20	18	7	25	
Dec. 13, 1913....	30	12	14	26	0.360
Dec. 15, 1913....	18	14	8	22	

The preparatory treatment in this case was very prolonged and consisted chiefly of catheter drainage, the forcing of water and the use of stimulants as indicated. During the first four weeks, the patient was uremic, on one occasion having convulsions. To this difficulty were added frequent breaks in cardiac compensation. On two occasions the life of the patient was apparently saved by the prompt use of strophanthin and camphorated oil. With improvement in the cardiac condition, allowing the use of water in larger amounts, the phenolsulphonephthalein output increased, remaining quite stable, and the blood urea was reduced to within normal limits. After thirteen weeks' preparatory treatment, a perineal prostatectomy was carried out. Recovery was uneventful. The phenolsulphonephthalein test on discharge showed an appearance time of twelve minutes, and output for the first hour 30 per cent. and second hour 10 per cent.

Comment.—This case shows what can be accomplished by preliminary renal and cardiac teratment in very bad cases. Examination one year after operation showed the cardiac and renal condition still greatly improved.

IV. CASES WITH HYPERTENSION

Arterial hypertension may exist independently of cardiac and renal disease, and moderate grades of it are seen without any discoverable organic change. The condition is most often associated, however, with renal or cardiovascular lesions, and its chief interest in this connection lies in the determination of its causation. If the responsibility rests with the kidney, the outlook will depend on the extent of the renal change and the degree of associated cardiovascular disease. As a condition per se, it rarely contraindicates prostatectomy, although in the severer forms, particularly when combined with marked arteriosclerosis, the risk of operation may be a very serious one.

The use of blood pressure lowering drugs in these cases is often dangerous, and at best the result is transitory. Rest in bed and the usual preliminary treatment in cases with associated back pressure symptoms are often productive of permanent results. We have seen frequently rather marked cases of hypertension occurring in individuals with long standing urinary retention and the usual back pressure phenomena. With rest in bed and catheter drainage, marked lowering of the blood pressure has frequently been coincident with improvement of the renal condition.

The following cases illustrate how uncertain the prognosis may be in this type of risk:

CASE 6.—M. E., aged 60, admitted Feb. 21, 1916, had prostatic obstruction for six months, and vesical calculus. No residual urine. Bladder capacity 90 c.c.. Specific gravity of urine, 1.016; no casts; faint trace of albumin. Appearance time of phenolsulphonephthalein, ten minutes; first hour, 48 per cent.; second hour, 15 per cent. Physical examination excellent except slight hypertrophy of left ventricle and blood pressure of 200. Patient was thought to be an excellent surgical risk, and prostatectomy was performed, February 28. After the patient's return to the ward it was noticed that he remained unconscious, and examination showed a left sided hemiplegia and evidently a cerebral hemorrhage which occurred during the anesthesia before or during the operation.

CASE 7.—G. R., aged 68, admitted Sept. 13, 1913, was perfectly sound in every respect except for hypertension. The treatment preparatory to operation was rest in bed and restriction of fluid intake to 1,500 c.c. The phenolsulphonephthalein tests and blood pressure readings follow:

TABLE 6.—PHENOLSULPHONEPHTHALEIN TESTS AND BLOOD PRESSURE READINGS IN CASE 7

Date	Appearance Time Min.	First Hour Per Cent.	Second Hour Per Cent.	Total Per Cent.	Blood Pressure
Sept. 13, 1913.....	22	40	10	50	210
Sept. 15, 1913.....	11	53	15	68	
Sept. 16, 1913.....	..	..	..	..	210
Sept. 18, 1913.....	..	..	..	..	200
Sept. 19, 1913.....	..	..	..	..	205
Sept. 20, 1913.....	..	..	..	..	210
Sept. 21, 1913.....	8	48	18	66	210
Sept. 22, 1913.....	..	..	..	..	210

Perineal prostatectomy was performed September 22. Recovery was uneventful.

Comment.—The determination of the degree of risk in a given case of pure hypertension is difficult, if not impossible. Advanced grades of cerebral arteriosclerosis may be present with very little change in the peripheral vessels, and a radial artery whose wall is barely palpable is no surety against a cerebral catas-

trophe. That sudden elevation in blood pressure may result in fatal hemorrhage should constantly be borne in mind, and for this reason we believe ether to be preferable to nitrous oxid as an anesthetic in these cases. The complication cited in the first case, however, is relatively uncommon, and in our series of nearly 1,000 perineal prostatectomies, it has occurred but twice.

V. CASES WITH INFECTION

The majority of patients requiring operation for the relief of prostatic obstruction have uninary infection and in a recent series of ninety-four cases, the urine of sixty-six, or 70 per cent., contained pus and microorganisms. The mere presence of bacteria in the urine without localizing signs is not alarming, but the occurrence of an acute process cannot be watched too carefully. Acute infections of the epididymis and urethra immediately call for a suspension in the use of the retention catheter. The majority of these cases can be tided over the course of the infection by interval catheterization, and the condition clears up promptly as a rule. In some instances the process is progressive, and if drainage of the bladder is necessary, a suprapubic cystostomy should be done. Many of these acute infections are secondary to the retention catheter, and can be prevented if sufficient care is exercised. Frequent changing of catheter, the substitution of interval catheterization in some cases, urethral and vesical injections of 5 per cent. argyrol and irrigations will do much toward diminishing the frequency of these complications.

As a fair statement of what can be accomplished by means of careful preparatory treatment, we think we may take the first years' work in the Brady Urological Institute from January, 1915, to January, 1916. During this time there were ninety-four cases in which prostatectomy was carried out, ninety by the perineal route and four suprapubically, with only one death, this patient being 93 years of age and dying of cerebral thrombosis on the thirteenth day after operation. An analysis of these cases is as follows: The average age was 67, the youngest 46, and the oldest 93 years of age. There were three over 80, fifteen over 75, twenty-three over 70. During this period every patient who came to the hospital suffering with pronounced obstruction from prostatic hypertrophy was operated on, so that there was no selection of cases. Fifty-three cases required considerable preliminary treatment, the longest being a period of sixty days; five cases required preliminary treatment over four weeks, nine over three weeks, twenty-three over two weeks, thirty-nine over one week, and eleven less than one week. The following analysis of the phenolsulphonephthalein records shows the splendid improvement which was obtained by means of preparatory treatment.

In the series of ninety-four cases, fifty-one, or 54 per cent., required preliminary catheter treatment, and of these, thirty showed on admission an output of less than 30 per cent. phenolsulphonephthalein for the first hour, and nineteen an output of less than 20 per cent. The preparatory treatment varied from four to sixty days, and at the time of operation, of these thirty cases, only ten had a first hour phenolsulphonephthalein of less than 30 per cent., and only one less than 20 per cent.

There were numerous cardiac lesions found in this series, both myocardial and valvular in character, and two extremely severe, one, a man 75 years of age, with a very bad heart from myocarditis, and another aged 66, whose case had been cited above. In regard to the cardiac cases we may say that almost every case, even those of very severe degree, can finally be got in sufficiently good condition for perineal prostatectomy under ether anesthesia, this anesthetic on account of its stimulating effect being preferable to anything else in cardiac cases. We are firmly convinced that these patients should not be operated on by spinal anesthesia.

High blood pressure was moderately common in this series of ninety-four cases, there being forty-two over 150 and fifteen over 170. In four cases the blood pressure was 200 or more, yet operation was successfully performed in each of these cases. Considerable care was taken in preliminary treatment in these cases, as described above.

A survey of these ninety-four patients, many of whom were very aged and infirm, shows that with proper care, perineal prostatectomy may indeed be called a benign operation. This, we believe, is due to various facts: The wound is extravesical, the drainage dependent, and the absorption of septic materials unquestionably less. Abdominal distention and other complications, which are not infrequently present after suprapubic prostatectomy, are very much less frequent after the perineal operation. The ability of the patient to get out of bed in a very few days, and the ease with which hemorrhage can be controlled, either by ligation of bleeding points at operation or packing, are very greatly in favor of the perineal route. These facts are mentioned because we believe that in severe cases, the choice of operation has almost as much to do with the ultimate result, particularly the mortality, as the preliminary treatment.

MECHANICS OF FRACTURES OF THE OS CALCIS

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Fractures of the os calcis are due to two factors: direct violence by a fall on the sole of the foot, and a strong contraction of the gastrocnemius, making a sudden upward pull, thereby putting tension on the Achilles tendon. We have to deal here with a short fragment attached to one of the strongest muscles of the body, tending to displace it gradually even further than it was carried by force of the direct violence, and in the same direction (from *C* to *D*; Fig. 1). This short posterior fragment forms the posterior third or quarter of the longitudinal arch of the foot (*E* to *H*), and, when displaced upward, lowers the arch of the foot (changing *CG* to *DG*), at the same time stretching or tearing the bowstring which holds this arch normally (*GH*) and is attached to the anterior surface of the posterior fragment of the os calcis, running forward to its fan-shaped anterior attachment around the metatarsal articulations. The result of the tearing or laceration of the plantar fascia, which was referred to as the bowstring of the arch of the foot, results in a flattening of the anterior portion of the arch of the foot, which, in turn, and in conjunction with the lowering of the posterior portion of the arch due to fracture, allows the foot to evert (bringing *E* and *A* nearer to each other), thereby bringing the fractured surface of the os calcis upward and outward toward the external malleolus (*A* to *B*).

This results, if allowed to progress to the deposition of callus around the fracture, in mass of callus forming just behind and below the external malleolus (between *A* and *B*), pinching the soft tissues between two bony surfaces, and giving severe pain. The foot, thus being everted, causes the weight line which normally should fall on the middle metatarsal bone to fall on the first metatarsal bone or inside of it, further throwing a strain on the already lacerated ligaments of the longitudinal arch and causing further flattening of the foot.

Fortunately Nature has provided an easy way to rid us of the upward pull of the gastrocnemius by making the Achilles tendon in such a way that it heals readily after subcutaneous tenotomy without further surgical procedure, and is firmly united by the time the fractured bone has become solid.

It is a simple procedure to introduce a tenotome under the skin and completely sever the Achilles tendon, thereby ridding us of the only tendency to displacement of the posterior fragment, which can now be replaced with the assurance that there will be no displacement on account of muscular action. If the fracture is impacted, the foot should be placed over an

Fig. 1.—*A*, external malleolus; *B*, site of fracture and callus formation which is brought close to *A* by a combination of falling of the arch and eversion of the foot; *H* to *G*, attachments of plantar fascia lacerated at time of fracture of the os calcis; *C* to *D*, distance the arch is lowered when the posterior fragment of the os calcis is pushed up. An eversion of the foot causes the internal malleolus, *F*, to be brought nearer the ground; it also throws the weight line drawn from the anterior superior spine of the ilium through the middle of the patella to fall over the first metatarsal, or inside of it, rather than on the middle metatarsal as it normally should.

orthopedic block (Fig. 2) with one hand above the heel and the other over the metatarsal bones, and the impaction broken up, forcing the heel and toe down and toward each other. This increases the arch and at the same time moves the fractured anterior surface of the posterior fragment downward and inward, increasing the distance between it and the external malleolus. The fragment replaced, the foot can then be put in a plaster cast in strong inversion (Fig. 3) further removing the line of fracture from the external malleolus. Before the cast is dry, the base of the thumb should be placed in the arch of the foot (Fig. 4) holding the soft plaster up against it. In this way there is an overcorrection, bringing the ends of the lacerated plantar fascia into apposition, and allowing the traumatized ligaments of the sole of the foot to contract before the cast is removed.

The cast should be allowed to remain on the foot for at least four weeks, and the patient admonished not to rest any weight whatsoever on it until two months have elapsed. When the cast is removed, dry or moist heat applications with expert massage should be instituted to increase the circulation in the ligaments

Fig. 2.—The proper position of the hands on the foot in bringing the heel and the toe close together over an orthopedic block and the reduction of fracture of the os calcis. If impaction is too firm to be broken up in this way, the foot should be placed in a sand bag and the posterior fragment struck a sharp blow with another sand bag which will relieve the impaction.

and fascias of the sole of the foot, establish motion in the ankle joint, and loosen the adhesions about the Achilles tendon. At the end of the two months the patient should be encouraged to put weight on the foot gradually, care being taken to notice whether the callus around the fracture is solid enough so that it will not allow angulation of the posterior fragment.

Fig. 3.—The position of the feet in plaster. Strong inversion with pressure under the instep.

The ligaments in the sole of the foot being weak and having a tendency to allow the foot to evert, the sole and heel of the shoe should be built up from one-eighth to one-quarter inch on the inside of the foot, so

that the body weight will fall on the flat outside portion of the foot and not overtax the weakened ligaments of the arch. The arch may be supported by adhesive plaster strapping in conjunction with a felt

Fig. 4.—Proper position of the hands in inverting the foot and putting pressure under the arch while plaster is still soft. Care should be taken that the hand on the outside of the foot, in this case the left, does not press the plaster against any bony points.

pad either held on by the straps or sewed on an insole, and placed in the shoe in such a manner as to support the longitudinal arch (Figs. 5 and 6).

The felt pad has proved much more satisfactory in the treatment of a weak foot than the metal plate, since it allows a moderate amount of strain to fall on

Fig. 5.—Inversion of the foot with felt pad under the arch for support, showing the method of using adhesive plaster.

the fascia, and being a spongy, elastic substance, it constantly massages the sole of the foot and increases the circulation. The metal plate acts as a rigid splint, relieving the ligaments of all strain, and thereby allowing them to weaken and to atrophy from lack of use.

Under this treatment, which has been extremely successful in my hands, we should have no permanent disabilities from fractures of the os calcis. There is no fracture in the body known which is more commonly overlooked and which will give more painful disability than a fracture of this kind, unless the mechanical details of the treatment are looked after carefully; and there is none easier to treat or which gives better results than this fracture, if promptly diagnosed and correctly treated. It is essential to examine with the Roentgen ray every patient who has sustained a fall on the sole of the foot, especially when there is pain and swelling underneath and posterior to the external and internal malleolus.

No fear should be felt in severing the Achilles tendon, since this structure has been cut subcutaneously by numerous men over a period of many years and practically never has failed to unite and refunctionate even in persons over 60 years of age, and it is absolutely impossible to hold the short posterior fragment

Fig. 6.—Completed strapping of the feet, with felt pad between adhesive and arches of the feet. The adhesive plaster is started on the upper outer surface of the foot, and brought downward and inward with the foot in strong inversion, bringing the plaster upward and outward on the outer surface of the legs.

of the fractured os calcis in proper apposition to the anterior portion without doing away with the pull of the muscles on the Achilles tendon.

30 North Michigan Avenue.

Transportation of Milk.—The milk ordinance of the city of Chicago, adopted in 1912, contained certain regulations with reference to the pasteurization of milk which were upheld by the state supreme court. Provisions of this ordinance required that the milk should be transported in sealed cans and prohibited bringing milk into the city the temperature of which was above 55 F. In a suit brought against a railroad company violating this provision with reference to temperature, the state supreme court decided that unless it could be shown it was possible for a railroad company to ascertain the temperature of the milk without having access to the interior of the cans, the ordinance was unreasonable and not enforceable. The court held, however, that a city has the right to protect the health of its citizens by reasonable regulations governing the transportation and sale of milk. The decision in full is printed in *Public Health Reports*, January 19.

FURTHER OBSERVATIONS ON THE USE OF THORIUM IN PYELOGRAPHY *

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Since the publication of the preliminary report[1] on the use of thorium solution as a pyelographic agent, many experimental investigations as to its pharmacologic action, and much clinical evidence after a year's experience in its use have led to the conclusion that it fulfils all the conditions requisite for an ideal pyelographic medium. These conditions are that the solution be nontoxic (within the ordinary limits of usage), nonirritating, opaque to the Roentgen ray, giving not only a good shadow but one of clear delineation, possess a marked degree of fluidity, and be inexpensive.

It is a well-known fact that the degree of opacity of an element to the Roentgen ray is directly proportional to its atomic weight. On this account, thorium, being next to the heaviest known element, seemed worthy of careful study. After an exhaustive investigation of its different salts and the various combinations into which they may enter, it was decided that the original solution, prepared in the manner suggested, and containing, as it does, the double citrate of thorium and sodium together with an excess of sodium citrate, and some sodium nitrate, was by far the best combination for use in pyelography. The solutions used contain 10 and 15 per cent. of thorium in the form noted, the 10 per cent. solution being used for cystograms, and the 15 per cent. for ureteropyelograms. The 15 per cent. solution contains approximately 15 per cent. of thorium nitrate, about 9 per cent. of sodium nitrate, and 21 per cent. of sodium citrate, the thorium being probably in the form of a double citrate of thorium and sodium, and not occurring as the nitrate.

Although solutions of thorium nitrate and thorium chlorid alone cannot be used clinically on account of their astringent and irritant action, and also the fact that they precipitate insoluble salts when brought in contact with the urine, they can be used to great advantage for outlining fine vessels and ducts in pathologic specimens. These specimens, after being injected with a rather concentrated solution of the chlorid or nitrate, are fixed in Kaiserling's solution, which causes a precipitation of the insoluble salts of thorium in the walls of the vessels and ducts, causing them to stand out with unusual clearness of delineation when a roentgenogram is made of the specimen so prepared.

Fig. 1.—Double pyelogram showing the same type of renal pelvis on each side. The pelves are rather small and the calices greatly elongated.

Since the thorium solution for clinical use contains a mixture of different salts, it was thought that a withdrawal of all of these excepting the double citrate of thorium and sodium (this salt being alone responsible for the shadow-casting properties) would be a great step toward simplification. The substitution of other salts, namely, the chlorid for the nitrate of thorium, in the preparation of the solution, was also tried. It was found, however, that either the solution of the double citrate alone or any modification of the original solution when used experimentally, caused either an increase in toxicity, or the production of symptoms which were not observed when the original solution was used.[2]

Fig. 2.—Double pyelogram; bilateral congenitally enlarged pelves.

The use of this solution in the urologic clinic of this hospital was begun one year ago. During this time it has been used in 185 cases, no untoward effects whatever having been observed. In five of the cases where it was injected into the renal pelvis and ureter there was a slight reaction characterized by a slight rise in temperature, nausea and vomiting, all of which promptly subsided. In one of these cases, on account of the marked irritability of the bladder, the patient had to be anesthetized before ureteral catheterization could be attempted; the etherization here could account for the symptoms produced. At any rate, these same symptoms could be accounted for by ureteral catheterization alone, for they occur fully as frequently in cases where no solution is introduced into the renal pelvis and ureter. In the series of cystograms there was nausea and vomiting in one case, and slight nausea and frequency of urination in another. In the former instance the nausea and vomiting occurred some hours after the cystogram had been made, and may have been due to some dietary indiscretion. In the latter instance, the patient was highly neurotic, which could readily account for the symptoms. As much as 600 c.c. of the 10 per cent. solution have been used in the entire urinary tract at one time. This patient, a boy 12 years of age, had a dilated and trabeculated bladder with dilatation of the internal vesical sphincter, double hydro-ureters, and hydronephroses due to a congenital obstruction in the posterior urethra. These conditions were all clearly demonstrated in the roentgenogram of this case. No change in phenolsulphonephthalein output or blood urea content after the introduction of this solution into the urinary tract was demonstrated in this case, nor has there been any interference with kidney function, as shown by these two methods of investigation, in any of the cases in which it has been used, even though in some of these cases there had been a marked reduction in phenolsulphonephthalein output, and an increase in the blood urea content before the injection was made. For pyelograms from 5 to 150 c.c. of the

* From the James Buchanan Brady Urological Institute.
* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Burns, J. E.: Thorium—A New Agent for Pyelography, Preliminary Report, THE JOURNAL A. M. A., June 26, 1915, p. 2126.

2. Burns, J. E.: Thorium—A New Agent for Pyelography, Bull. Johns Hopkins Hosp., 1916, **27**, 157.

15 per cent. solution have been used, and for cystograms almost a liter (quart) of the 10 per cent. solution.

Too much emphasis cannot be laid on the method of introduction of the solution into the renal pelvis and ureter. The gravity method is now recognized by urologists as being the most successful and the least dangerous for complete distention of the renal pelvis. This is accomplished by means of a buret with a rubber tubing connection and a properly fitting nozzle for the end of the ureteral catheter, the buret being held slightly above the level of the patient, and the solution being allowed to flow in until the patient complains of a sensation of fulness in either kidney region. The exposure to the Roentgen ray is then made, the solution being allowed to flow into the renal pelvis during the exposure. Injection by means of a syringe is dangerous because there is always a liability to overdistention of the pelvis, and forcing the solution into the renal parenchyma or into the perirenal tissues.

Fig. 3.—Double pyelogram; slight hydronephrosis on either side with marked irregularity of the outlines of the calices.

A word may be said here in regard to the making of pyelograms in cases where there is a marked impairment of kidney function. In these cases where the phenolsulphonephthalein output for two hours is only a trace, and the blood urea content well above normal, it may be well to avoid injecting both renal pelves at the same time. In such cases the simultaneous injection of both renal pelves with any solution might sufficiently derange the functional activity of the renal epithelium, which is already markedly impaired, to cause the onset of uremia. For this reason, it might be well to make a pyelogram on one side, and then wait a few days before making the other. Again, where large hydronephroses and greatly dilated ureters are suspected, it may be well to allow the ureteral catheters to remain in position sufficiently long to insure a complete removal of the solution, for, as is well known, the peristaltic activity of a greatly dilated ureter is always markedly impaired, and consequently the elimination of the solution would be greatly prolonged.

In pyelograms and cystograms made with this solution the outline of the renal pelvis and ureter, or the bladder, as the case may be, is not only remarkably definite but the shadow itself, even to its finest details, possesses an unusual clearness of delineation.

The accentuation of the shadows of calculi by this solution, when they are not seen in the plain roentgenogram, is brought about either by the adhesive properties of the solution, by its capability of being absorbed, or by means of its comparative density. For instance, in one case lately, the shadow of a ureteral calculus was brought out on one side where it was not seen in the plain roentgenogram, and on the other side, a renal calculus, which had previously been seen in the plain roentgenogram, was accentuated by the fact that its shadow was less dense than the shadow of the thorium solution surrounding it in the renal pelvis.

The solution is clear and watery, and possesses such a marked degree of fluidity that it readily escapes from the renal pelvis, ureter and bladder. This is shown by the fact that a plate made a few minutes after the injection has been discontinued gives no suggestion of a shadow, and assures its complete elimination from the urinary tract.

The solution is not irritating to the mucous membranes of the renal pelvis, ureters and bladder. This is demonstrated by the fact that no urinary symptoms have been observed in the cases in which it has been used. No inflammation of the vesical mucous membrane has been observed at subsequent cystoscopic examination. In cases which have come to operation within a few hours or days after the injection, examination of the bladder, ureters and renal pelvis has shown no evidence whatsoever of any irritative action. Experimentally there has been no sign of any irritative action to the peritoneum in animals into whose peritoneal cavities this solution has been introduced, and all of the fluid has been absorbed in most instances. In the preparation of the solution too much emphasis cannot be laid on its careful neutralization, and it is felt that this fact alone is responsible for the absence of any irritative action.

The solution must be sterilized and kept sterile while being used, because, although it exhibits an inhibitory action on the growth of the ordinary bacteria, it is not bactericidal, and molds grow in it on standing. It has been found that sterilization and resterilization of the same solution do not affect its stability in the least.

As regards its use in bladder and kidney injections, no evidence of toxicity has been observed. Experimentally this solution is far less toxic than collargol. In animals where it has been given in small doses subcutaneously, intramuscularly, intraperitoneally and intravenously there has been no effect. Larger doses have occasionally produced gastro-intestinal symptoms, while very large doses have in some instances produced death. These fatal doses, of course, were far above the ordinary limits of clinical usage. In a few instances, 2 c.c. of this 15 per cent. solution per kilogram (intraperitoneally and intramuscularly) proved fatal, much larger doses being required intravenously to produce death. This, in the case of an ordinary man of 70 kg., would allow the escape of 140 c.c. of the solution into his tissues before evidence of toxicity—ten times as much as is used in a simple pyelogram, and hundreds of times greater than any small amount that might be absorbed during the procedure. Much larger amounts have been used in the renal pelvis without any ill effects.

Fig. 4.—Double pyelogram showing well marked bilateral hydronephroses and hydro-ureters with kinking of the right ureter due to narrowing of the ureterovesical orifice.

CONCLUSIONS

1. Thorium solution fulfils all the conditions necessary for an ideal pyelographic medium.

2. Clinically there has never been the slightest evidence of toxicity in a series of 185 cases, the amounts used in a single case varying from a few cubic centimeters to a liter. This alone is proof of its nontoxicity.

3. Experimentally, although in a few instances death has followed the injection of large doses into the peritoneal cavity and tissues of animals, larger doses intraperitoneally and intravenously have produced no effect.

4. That the solution is nonirritating is shown by the absence of any urinary symptoms after its use and the absolute lack of any such evidence cystoscopically, and at operation.

5. The pyelograms and cystograms made with this solution show a splendid shadow which possesses an unusual clearness of delineation.

6. The solution is clear and watery; therefore it possesses a great degree of fluidity, permitting its ready elimination from the urinary tract.

7. It is perfectly clean and does not stain the linen. In this particular it possesses another marked advantage over other solutions, particularly those of the silver salts.

8. It is quite inexpensive, being about one third as costly as collargol.

ABSTRACT OF DISCUSSION

DR. JOHN T. GERAGHTY, Baltimore: Pyelography has become almost indispensable. In certain cases it is practically the only means we have of arriving at an accurate diagnosis. For that reason it is very necessary that we have a substance which is comparatively free from danger, and I think Dr. Burns has given us such a substance. I do not think you will ever be able to introduce into the kidney a foreign substance in cases that should not have pyelography: I think you would endanger the kidney by injecting salt solution under force. The mere catheterization in some cases may be sufficient to induce uremia, particularly in cases with marked reduction in function, and if bilateral. So that it is essential in very bad kidneys to have a substance not irritating and that will not reduce the function. I do not believe that thorium will injure the kidney any more than salt solution will.

Fig. 5.—Double pyelogram showing double renal pelvis and double ureter on the right side with a calculus in the upper pelvis. Moderate grade of hydronephrosis on the left side due to stone in the lower end of the left ureter.

DR. WILLIAM F. BRAASCH, Rochester, Minn.: The value of pyelography is well understood now and generally recognized. It is unfortunate that a year or two ago so many accidents were reported with its use. It was in danger of falling into disuse. By means of thorium, however, it is very probable that pyelography will come into its own. Several years ago I said that that medium which was in thorough solution and which was nonirritating would be the best. Colloidal silver solutions are not solutions; they are suspensions. Some are more or less irritating, and therefore we had two important objections to pyelography. The ill results following pyelography were the results of two distinct errors of technic—overdistention, and permitting the fluids to remain in the distended pelvis where they could not drain out again. Thorium is a medium in solution, and which, even if injected into a distended pelvis and retained, will, as a rule, not cause any trouble. I have seen four or five cases in which thorium was injected into large hydronephrotic sacs and cortical necrosis resulted. I do not know whether it was due to the thorium alone or to a secondary infection that happened at the time of the injection of the thorium. I am under the impression it was the latter, but we should not jump to the conclusion because thorium has so many advantages over colloidal silver. I still maintain that pyelography should not be done when we can make a diagnosis without it. One objection to thorium is the fact that it does not give as good an outline of the ureter as do the colloidal silver salts. Great care is required in the preparation of thorium and the ordinary chemist or druggist is not competent to do it. The uniformity of clear cut delineation is not present as frequently as with collargol. When there is no danger of retention and I wish to get a clear outline of the calices I still employ a 15 per cent. collargol solution.

DR. O. S. LOWSLEY, New York: I want to add a word of warning in regard to the use of thorium. In one of the clinics I am connected with we have been using thorium in all cases of pyelography. We have never had any bad effects, but one of my confrères reported a case in which he had used thorium by gravity and gravity distention of the kidney pelvis, and when the first cessation of the flow appeared, or the patient complained of pain, a small amount of the solution was allowed to flow back before the picture was taken. My confrère used thorium according to Dr. Burns' method. After the patient had passed a lot of black, tarry-looking, bloody material, she went into shock and died. I am not exactly familiar with the history of the case. She may have been one of the patients who should not have been pyelographed at all, but death apparently resulted from thorium.

DR. E. O. SMITH, Cincinnati: Some years ago I reported a death from pyelography. The patient was an aged lady who had a number of pathologic conditions, and perhaps this particular examination should not have been undertaken. The patient died within five minutes after the pelvis of the kidney was dilated with slight gravity pressure and the picture taken. She did not die from toxicity, but from shock. All of us have seen cases and had experiences where there was pronounced shock following this method of examination. Another case that came to me was a particularly sad experience. It was that of a physician, a man past 60 years of age, who had a tumor mass in his left side. We were unable to find anything abnormal in his urine, using the ordinary tests. As a matter of differentiation to determine whether or not the mass was in the kidney pyelography was done. The left kidney pelvis was injected under gravity with 10 per cent. collargol. This man suffered excruciating pain shortly afterward. We went to his home 40 miles in the country the following day. He passed absolutely no urine after we injected the pelvis of the kidney. He died about five days afterward from anuria. This emphasizes the point we ought to bear in mind that a distention of one kidney or some irritation produced in the kidney by this method of examination may have its effect on the other kidney, and this patient evidently had that effect, because the other kidney was catheterized at the time and there was nothing wrong with its function. Having these experiences in mind, I am like Dr. Braasch and take the position that this method of examination should not be employed until all other methods have been tried. We use it as a last resort.

DR. J. EDWARD BURNS, Baltimore: There are certain borderline cases in which pyelography should not be employed. In those cases in which the functional activity of the kidney is markedly impaired; for instance, those in which only a trace of phenolsulphonephthalein is excreted in two hours and the blood urea content is above normal on preliminary examination, a double pyelogram should be made with the greatest care. It would be better to make a pyelogram of one side and then wait a few days before making one of the other side, because the activity of the renal epithelium is in a state of unstable equilibrium, so to speak, just on the borderline, and the balance can readily be upset by the introduction of any solution. In regard to the introduction of the solution, it has been brought out in the discussion, and has been known for some time, that the least harmful and the most successful

procedure for insuring complete distention of the renal pelvis is the gravity method, and as I stated previously, in our record of 185 cases in which this thorium solution has been used by this method we have had absolutely no trouble whatever. In cases where hydro-ureter and hydronephrosis are suspected it is well to leave the ureteral catheter in place for a while, so as to insure the drainage of as much of the solution from the pelvis and ureter as possible, because the peristaltic activity of the ureter is greatly impaired in these cases and for that reason their emptying is greatly prolonged. In borderline cases where there is marked impairment of function and pyelography is done, I do not feel that any harmful results could be attributed to the solution used for it is largely due to the fact that the patient is in such a state that the functional equilibrium of the kidneys can be upset easily and by anything. Dr. Lowsley did not state as to whether the case he reported had been worked out from a functional standpoint or not previous to the injection of the renal pelves so it would be pretty hard in a case like that to say definitely whether the solution had anything to do with the death of the patient or not. It is always well to have the renal function worked out definitely before pyelography is undertaken. We have had absolutely no trouble whatsoever at the Brady Urological Institute in the use of this solution.

THE TRANSPLANTATION OF FAT IN PROSTATIC AND KIDNEY SURGERY *

IRVIN S. KOLL, B.S., M.D.
Professor of Genito-Urinary Surgery, Post-Graduate Medical School and Hospital; Associate Genito-Urinary Surgeon, Michael Reese Hospital
CHICAGO

In the desire to utilize some means less mechanical than the various procedures suggested for the prevention of postoperative hemorrhage in suprapubic prostatectomy, nephrotomy and pyelotomy, this work was undertaken.

Fig. 1.—Kidney lacerated in several places. Fat sutured into wound. Ten days after operation.

The use of fat in surgery dates back to 1893, when Neuber suggested its use in lacerations of the liver. His work was followed by Lexer and Czerny, and later by Klopfer in bone surgery. I have been unable to find any reference made to the use of fat in kidney or prostatic surgery, except that of a preliminary report by Dr. Kolischer,[1] which appeared two years ago.

The experiments were carried out on dogs. The kidneys were traumatized by crushing and lacerating and nephrotomized in various ways, also decapsulated, and fat from either the same animal or previously obtained from another dog sutured or tied into or over the wounds. Some of the transplants were infected with colon bacilli and some with staphylococci.

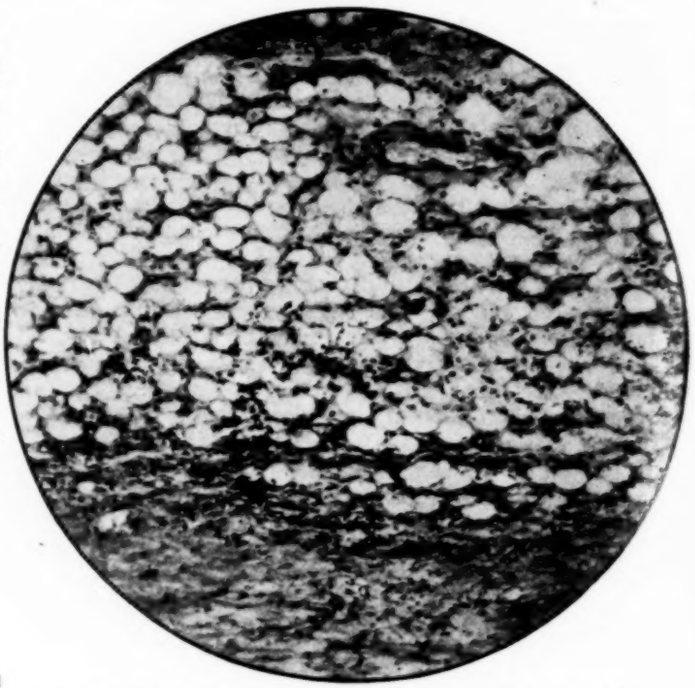

Fig. 2.—Section taken from *A*, showing progressive metamorphosis of the fat replacing the capsule, which was peeled off. Ten days after operation.

It was in every instance very striking to see how promptly the bleeding stopped. The kidneys were removed at periods following the operation varying from one day to six months.

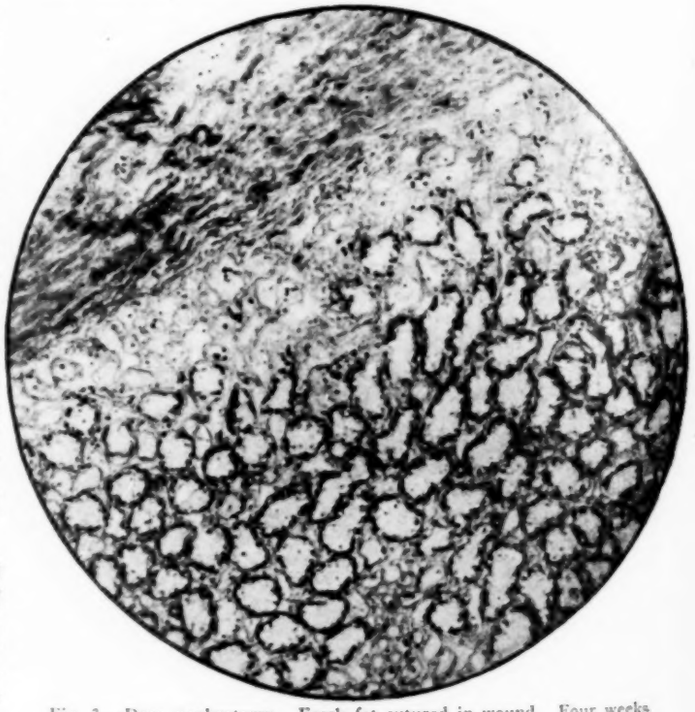

Fig. 3.—Deep nephrotomy. Fresh fat sutured in wound. Four weeks after operation.

On account of the anatomy of the prostate in the dog, the human prostatectomy could not be simulated. By making pockets out of flaps of the bladder wall

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* From the Department of Experimental Surgery of the Morris Institute of Medical Research, Michael Reese Hospital.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. Kolischer: Urol. and Cutan. Rev., December, 1914.

Fig. 4.—Deep incision into kidney. Fat fixed in wound with three sutures. Fourteen days after operation.

it was possible to study the effect on fat transplanted into the bladder. In each instance the fat rapidly disintegrated and completely disappeared from these formed pockets.

Clinically, the experience has been more limited to the prostate. The technic is simply to fill up the cavity made by the enucleation of the prostate and suture over the edges of the mucous membrane, leaving just enough of an opening for drainage and sloughing of the fat, which always takes place in two or three days, when it has served the purpose for which it was intended. The fat can be taken from the abdominal incision of the patient, if he is sufficiently adipose or, better still, obtained from a dog previously. Kept on ice in normal salt solution, in air-tight containers, the fat can be preserved indefinitely. In almost every instance the oozing, as noted by the colored urine, will cease in twenty-four hours.

This use of fat has also been tried in a number of nephrotomies for the removal of calculi from the parenchyma, and on several pyelotomies; also on one ruptured kidney by Dr. Kolischer. In the latter case the bleeding stopped immediately following the suturing of the fat over the rupture, and some months later was functionating without any hematuria.

The study of sections taken from the areas in which the fat was transplanted shows a typical metaplasia of reticular connective tissue, becoming fibrous. Grossly, in most instances where the traum was sufficiently extensive, secondary contraction reduces the kidney to one half or one quarter its normal size. The process begins promptly, and in twenty-four hours the fibrin deposits show beginning organization. The ultimate change is reached in three to four months in the absence of infection, and somewhat later in the presence of bacteria. Infection, however, does not change the end-results at the site of the transplant, though the renal parenchyma remote from the transplant gives evidence of bacterial invasion.

Fig. 5.—Scalpel plunged from cortex down to pelvis. Wound then plugged with fat. Twenty-eight days after operation.

A new capsule forms where decapsulation has been done, the structure of which closely resembles that of the original kidney capsule. This probably explains why the Edebohls operation for the relief of chronic interstitial nephritis ultimately fails.

In every specimen examined there is considerable necrosis of the renal tissue for some distance from the point of trauma. This necrosis should suggest refraining from the unsurgical procedure of cutting into the kidney for the search of calculi. The necrotic area is replaced by fibrous tissue, and in later months cannot be distinguished from the changed fatty transplant.

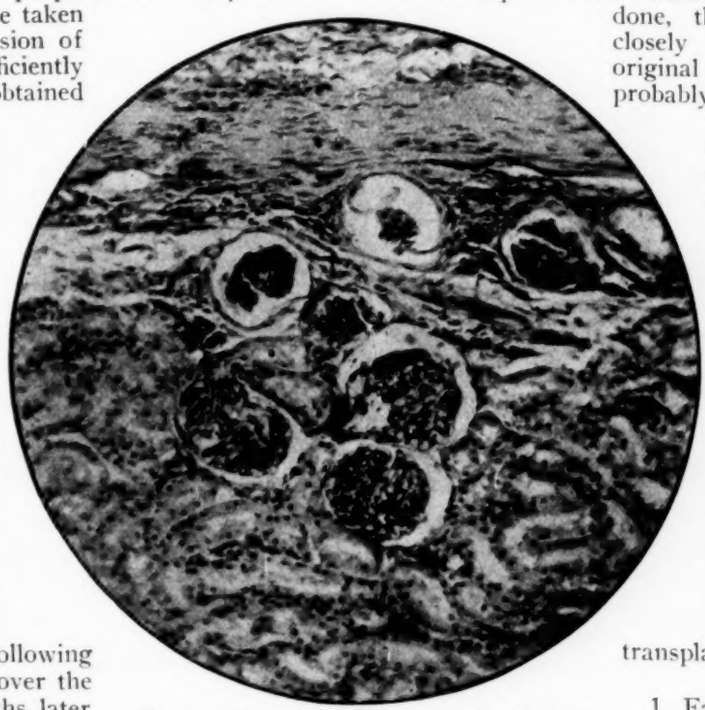

Fig. 6.—Kidney decapsulated, covered with fresh fat and then injected with staphylococci. Sixty-nine days after operation. (Note: New capsule of converted connective tissue. Glomerulitis.)

SUMMARY

1. Fat is a valuable hemostatic following prostatectomy and in operations on the kidney.

2. The change into fibrous connective tissue is complete in from three to four months.

3. Infection does not alter the metaplasia, though it delays it.

Fig. 7.—Deep nephrotomy. Fresh fat sutured in wound. Four weeks after operation.

Fig. 8.—Nephrotomy filled with fat, one week old. Thirty-seven days after operation.

Fig. 9.—Deep nephrotomy, filled with fat and infected with twenty-four hours' colon bacillus culture. Two and one-half months after operation.

4. When placed over a decapsulated kidney, a new capsule is formed.

5. Incision into healthy kidney is followed by extensive necrosis, which is replaced by fibrous tissue.

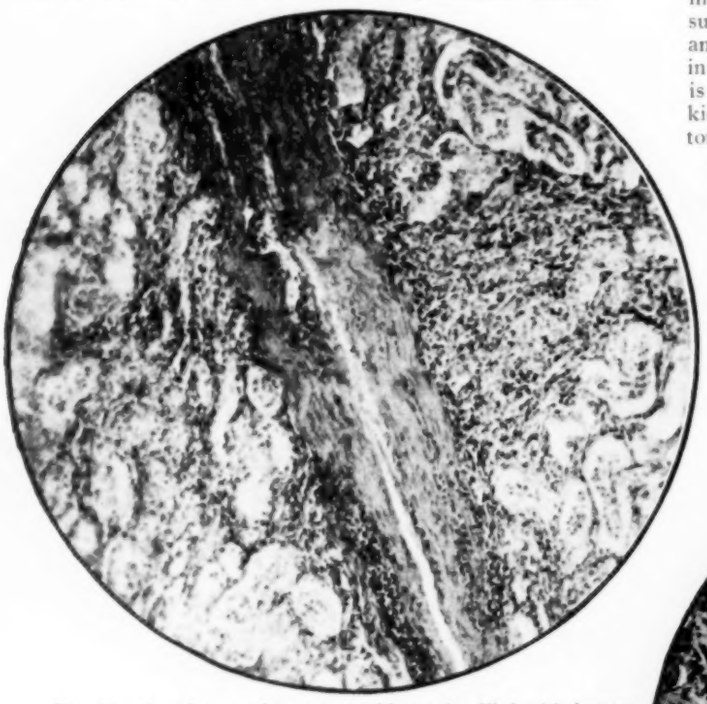

Fig. 10.—One deep nephrotomy at either pole, filled with human fat, one day old. Seventy-six days after operation. Kidney was shrunken to one quarter its normal size. (Note: Change of fat into fibrous connective tissue. Extensive change in tubules.)

Contrary to the usual sequence, clinical experience preceded the laboratory work, and I am indebted to Dr. G. Kolischer for the inspiration leading to this work.

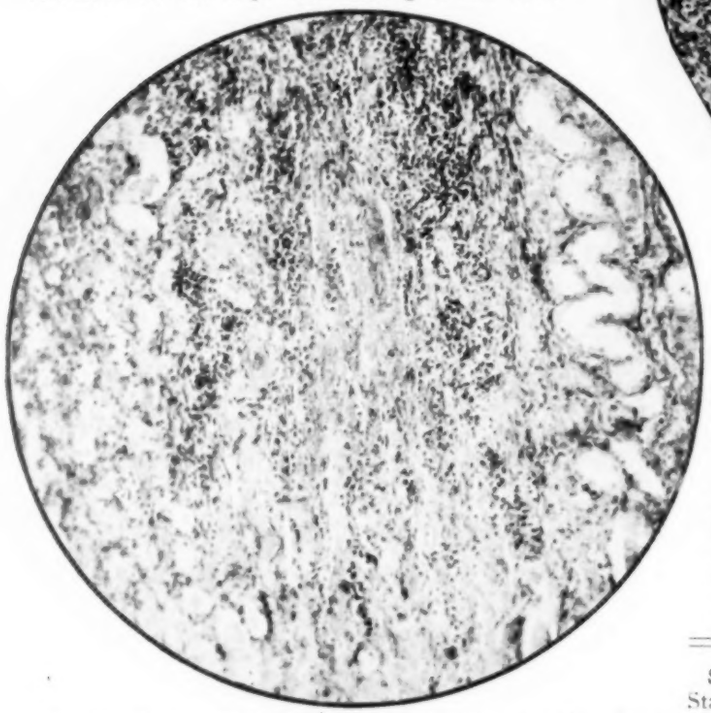

Fig. 11.—Nephrotomy filled with fat and injected with culture staphylococci. Two months after operation.

ABSTRACT OF DISCUSSION

DR. G. KOLISCHER, Chicago: I hope that these experiments will encourage you to use this transplantation of fat in renal and bladder surgery rather extensively. For the efficiency of this method I have plenty of clinical evidence. I want to mention three types of procedure. The first is the reinforcement of the pelvis of the kidney after pyelotomy. After the incision in the pelvis is sewed up we leave the ends of the sutures long, and then we pull up a flap of the peritoneal fat and tie it over the pelvis with the long ends of the suture; in that way the oozing stops immediately. The second type is the padding of the kidney incision for a rupture in the kidney or after a nephrotomy. The third type is in prostatectomy: I am convinced that a great many of our prostatectomized patients used to die by simply oozing themselves to death through the bladder. In order to prevent hemorrhage we place a piece of fat in the cavity, and anchor it with a few stitches.

DR. H. J. SCHERCK, St. Louis: About a year ago Dr. Kolischer suggested this method to me, and since that time I have had occasion to use fat in three cases of traumatized kidneys in a railroad hospital, and in all of the cases the result was entirely satisfactory. I have used it a number of times in prostatic surgery where the bleeding seemed to be excessive, and found it entirely satisfactory.

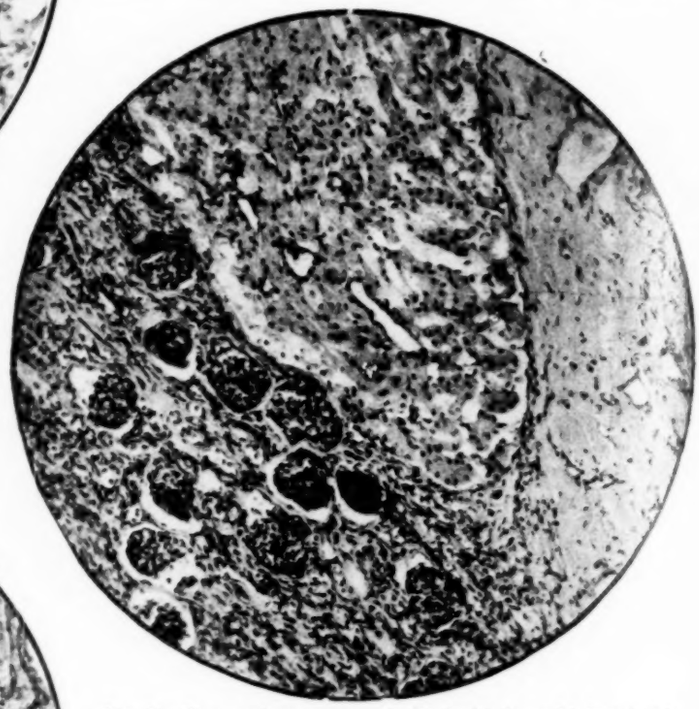

Fig. 12.—Two nephrotomy wounds filled with fat and infected with B. coli. Three and one-half months after operation.

DR. DAVID W. MACKENZIE, New York: I got the fat suggestion from Dr. Charles Gibson of New York, who has tried it, I believe, in a number of kidney cases, sometimes without drainage. I have always drained. I have never used it in the prostate. It seems very simple.

DR. IRVIN S. KOLL, Chicago: I want to emphasize the fact that you need have no hesitancy in removing the fat from a dog. Put it in air-tight containers on ice and it will keep indefinitely. I think it is of advantage to do this, because where you remove it from the abdominal wall in a prostatectomy it delays the operation, leaves an open space, and it takes time to ligate the bleeding vessels.

Spotted Fever.—According to the annual report of the Idaho State Board of Health, Rocky Mountain spotted or tick fever decreased one half during 1916 as compared with the previous year. In 1915 there were 349 cases, resulting in fourteen deaths. In 1916 there were only 148 cases, eleven resulting in death. The disease has been studied since 1910 by the state and federal authorities, and the reduction in the number of cases is attributed to these investigations.

MIGRATION OF SHELL FRAGMENT FROM RIGHT FEMORAL VEIN TO RIGHT VENTRICLE OF HEART

GENERALIZED GAS BACILLUS INFECTION *

HENRY H. M. LYLE, M.D.

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NEW YORK

History.—The patient, F. A., Eighth Zouaves, was brought, June 16, at 3:30 a. m., to the ambulance. Four hours previously he had received a perforating shell wound of the left thigh 4 cm. above the knee, and a penetrating shell wound of the right thigh. A fluoroscopic examination of the thigh and lower abdomen failed to reveal any foreign body. Unfortunately the upper abdomen and thorax were not examined. The failure to find the shell fragment was puzzling, as the depth and direction of the wound seemed to preclude the possibility of the particle having fallen out.

The patient was in a condition of mild shock. The temperature was 97.2, pulse 120, respiration 28. Physical examination of the chest and abdomen was negative.

Operation.—The contused skin edges were cut away, the wound laid open, and the projectile tract lightly but methodically excised. No foreign bodies were discovered. At the bottom of the wound of the right thigh, the femoral vessels were found embedded in a clot; the femoral vein was bruised but apparently intact. Two Carrel instillation tubes were inserted, and 20 c.c. of Dakin's hypochlorite solution were delivered to the wound every two hours.

Fig. 1.—Femoral vein and artery, showing the wound in the femoral vein.

The patient appeared drowsy and slept the major portion of the first two days. On the third day the abdomen became greatly distended, and he complained of pain and tenderness over the spleen and right kidney. The distention was partially relieved by lavage and enemas. Jaundice appeared on the morning of the fourth day, and was accompanied by pain and tenderness over the liver. The temperature rose to 102.2, the pulse to 132, and the respiration to 32. Fine moist râles were heard at the left base. The area of cardiac dulness had increased, a distinct pericardial rub was heard, and the cardiac sounds were indistinct. A provisional diagnosis of general gas bacillus infection with pericarditis and pneumonia was made. In the afternoon there was a temporary improvement, followed by sudden death at 5:30. Throughout the course the wound remained sterile.

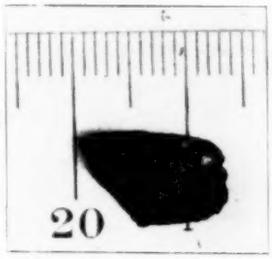

Fig. 2.—The shell fragment carried by the blood stream from the right femoral vein to the right ventricle.

Necropsy (Dr. Proctor).—The body is that of a man, aged 31, medium frame, fairly well nourished. The skin is deeply jaundiced. There are no wounds of the abdomen or thorax. The wounds of the thigh are clean. The wound of the right thigh is 10 cm. below and 5 cm. posterior to the anterior superior spine of the ilium. The tract leads forward, downward and inward to the femoral vein (Fig. 1). In the external wall to the vein there is a small valve-like wound sealed by an organized clot. There is no local evidence of gas infection. Both lungs are edematous; there is a fibropurulent pericarditis with free gas in the pericardial cavity. The heart is enlarged, and its external surface is covered with a fibropurulent exudate. The cut section of the heart gives a gaseous crepitation. There is a rough shell fragment free in the cavity of the right ventricle (Fig. 2). The shell fragment measures 1.5 cm. in length, 0.9 cm. in width, and 0.5 cm. in thickness, and weighs 1.81 gm. There are fibers of clothing adherent to the irregular surface of the shell. The liver, spleen and kidneys are enlarged. On cut section all give gaseous crepitation. There is no obstruction to the gallbladder or gallducts.

Revised Diagnosis.—Perforating wound of the left thigh, penetrating wound of the right femoral vein, migration of the shell fragment to the right ventricle of the heart. General gas bacillus infection. No local infection of the wound.

Besides the extreme rarity of the case, the following points are worthy of notice:

1. The carrying of a rough shell fragment by the blood stream from the right femoral vein to the right ventricle, the patient living four days and eighteen hours.

2. The sealing up of the wound in the vein.

3. The sterilization of the local wounds by the Carrel method, the generalized gas infection having undoubtedly arisen from the clothes on the shell fragment.

A fluoroscopic examination of the upper abdomen might have revealed the presence of the shell fragment. It then would have been a simple matter to milk the fragment into an unimportant vein from where it could have been easily removed. This has already been done in the case of a shrapnel ball.[1]

50 East Fifty-Third Street.

1. Grandgérard: Presse méd., Aug. 27, 1916, p. 365.

* The heart, shell fragment and vein were shown before the Surgical section of the New York Academy of Medicine, Oct. 6, 1916.

End-Result Investigation.—The investigation of surgical end-results is a matter of serious importance. The employment of special workers to carry on end-result investigations in the field is now the practice of a number of hospitals. Despite the cost involved, such proposals should be sympathetically received by hospital administrators. The hospital is one of the greatest of existing social institutions, supported in this country at a total cost which staggers the imagination. The value of its output must not be assumed, but must be proved. The altruistic hospital surgeon will not permit his equanimity to be disturbed by the revelations of end-result investigations; if the disclosures are sometimes surprising, they are always instructive.—S. S. Goldwater, M.D., *Modern Hospital*, November, 1916.

LYMPHOGENOUS ASCENDING INFECTION OF THE URINARY TRACT *

DANIEL N. EISENDRATH, A.B., M.D.
AND
OSCAR T. SCHULTZ, A.B., M.D.
CHICAGO

In an earlier communication[1] we reported the results of a series of experiments which showed that infection of the upper urinary tract can take place when an emulsion of organisms is injected into the bladders of rabbits and dogs. Our studies in this first series enabled us to conclude that the paths along which the infection travels are the lymphatics of the wall of the ureter and of the renal pelvis. The view that infection reaches the kidney from the bladder by way of the lumen of the ureter must, we feel, be abandoned, except for those cases in which an almost complete obstruction exists. In our first paper we reviewed the work of earlier investigators, which was performed under conditions seldom met with in the human being. In the majority of experiments cultures were injected into the ligated ureter. Under these conditions it was not surprising to find organisms within seven hours in the tubules of the kidney.[2]

Other investigators, like Sweet[3] and Sweet and Stewart,[4] implanted the cut ends of the ureters into the intestine. They called attention to the same perivascular areas of infiltration as we have found and to the probability that the infection travels by way of the interstitial lymphatics of the ureter. Their method is open to criticism because the changes which take place after reimplantation of the ureter into the intestine are so intense and occur so early that it is impossible to follow the paths of infection. It also opens up the lymphatics in a manner practically never met with in our clinical cases. Hess[5] injected cultures into the bladder and found no changes after intravesical inoculation alone, but these results may have been due to the small amount injected and the long interval which elapsed between the time of the experiment and the time microscopic examination was made. Our technic was the same in both series of experiments. The organisms employed were *Bacillus coli, Staphylococcus aureus* and *Bacillus proteus.*

An emulsion of sterile salt solution and scrapings of four agar slant cultures of the organisms was injected through a silver cannula into the bladders of female animals.[6] Before this intravesical inoculation some of the urine was obtained for cultures, so as to determine the presence of any preexisting infection. The cultures taken from the urine before the experiments were sterile in all of the animals of both series. Every precaution was taken to avoid injury to the urethra and bladder, and a minimal degree of force was used in injecting the emulsion. By following this method we imitated the conditions existing clinically as closely as possible. There was absolutely no interference with the sphincteric action present at the vesical end of the ureter, our idea being to permit the organisms to invade the bladder mucosa and be carried into the intramural and periureteral lymphatics of the ureter through the anastomosis of the lymphatics of the bladder and ureter, previously discovered by Stahr,[7] and Bauereisen,[8] referred to in our first communication.[1]

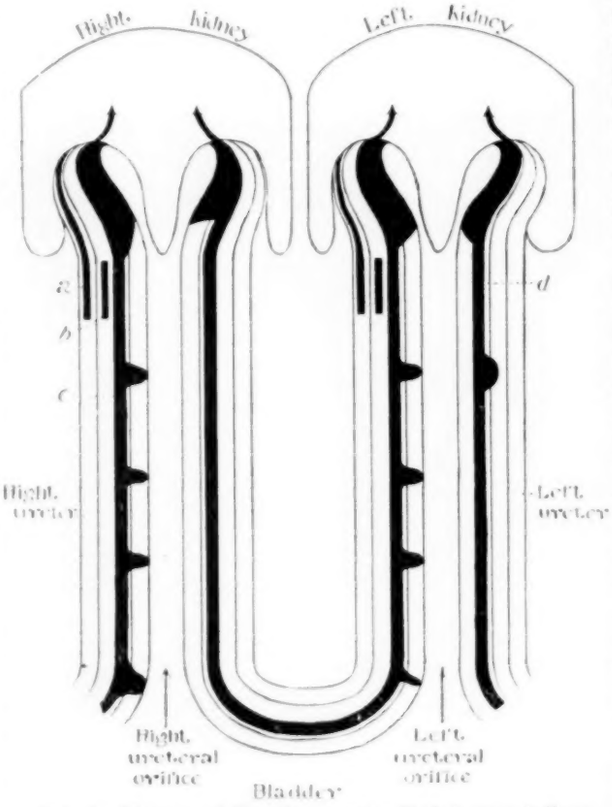

Fig. 1.—Diagram of Experiment 423. Shaded areas indicate paths of infection as indicated by inflammatory infiltration, which could be followed from the bladder to the kidney; *c*, submucous infiltration, with occasional extension into the mucosa; *b* and *a*, infiltration in muscular and periureteral coats; *d*, submucous infiltration in left ureter, extending at one level into the muscular coat.

Our animals were killed at varying intervals with strychnin, and cultures were immediately made from the heart's blood, both kidneys, and from the bladder. Serial sections of the entire ureter and renal pelvis were made in order to follow the paths of infection from one level to the next higher in longitudinal sections. Portions of the bladder at some distance from the vesical end of the ureter and areas from every portion of the kidney were also examined in serial sections.

We employed only dogs in our second series, because of the presence of slight inflammatory changes in the rabbit controls of the first series. All of the blood cultures of the second series were negative. The organism injected was found at necropsy in the bladder of two animals, but never in the kidneys, out of a total of thirteen experiments.

The ureter and renal pelvis showed evidence of involvement of varying grade in every dog. In three of the animals, one inoculated with *B. coli* and two with *B. proteus,* the kidney was also involved.

We believe that our method of injecting the organisms reproduces as closely as possible the conditions found clinically in infections of the lower urinary tract. The negative cultures of the urine obtained

* From the Nelson Morris Institute for Medical Research of the Michael Reese Hospital, Chicago.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Eisendrath, D. N., and Kahn, J. V.: Rôle of the Lymphatics in Ascending Renal Infection, THE JOURNAL A. M. A., Feb. 19, 1916, p. 561.
2. Schmidt and Aschoff: Die Pyelonephritis, Jena, 1893.
3. Sweet: Univ. Penn. Med. Bull., 1910, **23**, 233.
4. Sweet and Stewart: Surg., Gynec. and Obst., 1914, **18**, 460.
5. Hess: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1913, **26**, 135.
6. The animals were anesthetized and the external genitals thoroughly cleansed and the labia retracted before the canula was introduced so as to eliminate any possibility of introducing infection from the vagina.
7. Stahr: Arch. f. Anat. u. Physiol., 1900, p. 41.
8. Bauereisen: Ztschr. f. gynaek. Urol., 1911, **2**, 235.

before injection prove the absence of any previous infection. The negative blood cultures in twenty-six animals of the first series and in thirteen of the second series eliminates the possibility of a hematogenous infection.

The details of the experiments will be published elsewhere, but the summarized microscopic findings in two typical experiments are given herewith. In Experiment 423 an emulsion of *B. coli* was injected into the bladder and the dog was killed five days later. In this animal the inflammatory infiltration, as shown in Figure 1, follows the lymphatics of the submucous coat from the bladder into the ureter. Near the upper ends of the two ureters the outer coats become markedly involved and the renal pelvis is the seat of an intense, subacute, inflammatory reaction. From the pelvis the infiltration can be followed into the parenchyma of the kidney along the course of the intrarenal lymphatics. The lining epithelium of the ureter and of the renal pelvis is intact, except where it has become secondarily invaded by inflammatory foci which had their origin in the subjacent coat (Fig. 1).

Throughout the urinary tract the inflammatory process is characterized by focal lymphoid infiltration about smaller blood vessels and lymphatics. In Experiment 431, a dog killed five days after injection of *B. proteus* into the bladder, the involvement is somewhat different in that it is most marked in the upper portion of the urinary tract (Fig. 2). In the renal pelvis the inflammatory reaction becomes quite intense and from the pelvis extends up into the medullary tissue of the kidney in the form of intertubular perivascular bands of lymphoid infiltration. In the ureters of this animal the only change of any importance to which we would call attention is swelling and proliferation of the endothelium of the lymphatics, about some of which there is a very narrow zone of lymphoid infiltration.

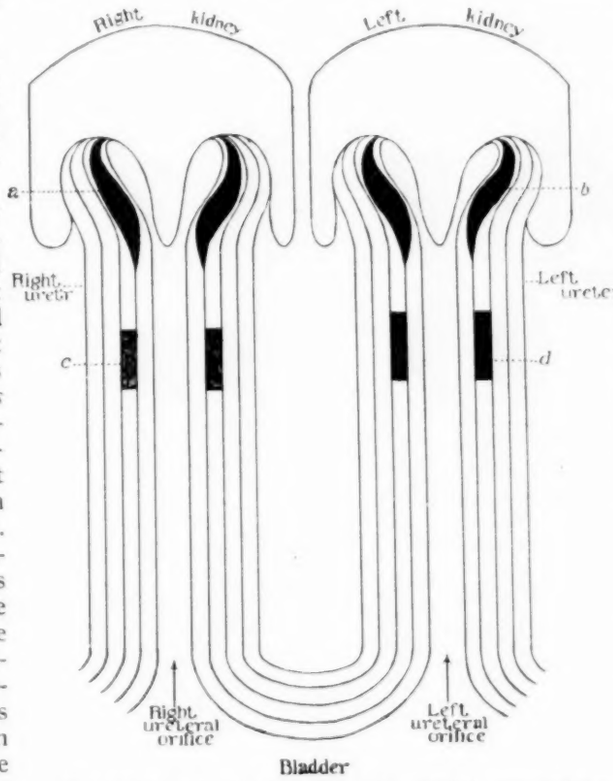

Fig. 2.—Diagram of Experiment 431. Shaded areas indicate regions of infiltration in submucous and mucous coat of right (*a*) and left (*b*) renal pelves; the infiltration in the submucous coat of the ureters is shown at *c* and *d*.

Seven uninoculated dogs were examined as controls, the examination in each case being based on serial sections of the entire urinary tract from the bladder to the kidney. All were negative with one exception, in which the ureter and renal pelvis showed slight foci of perivascular infiltration, similar to those found in animals killed at longer periods after inoculation. This finding in one control dog does not invalidate our experiments, but rather strengthens them and indicates that dogs are susceptible under natural conditions to ascending infections of the urinary tract by way of the interstitial lymphatics of the ureter.

The microscopic findings in our second series agree in every respect with those of the first series of experiments. The most marked reaction occurs after *B. coli* and the least after *Staphylococcus aureus,* while after *B. proteus* there is a reaction intermediate between the other two. Common to all of the experiments was the intact condition of the lining epithelium of the urinary tract. The inflammatory changes followed the course of the lymphatics from the bladder to the ureter and from this in turn to the renal pelvis and kidney in such a large number of experiments that we believe there can no longer be any doubt about the paths in ascending infections of the urinary tract.

A glance at Figure 3 will impress one with the importance of the clinical application of our experimental work. Organisms can be carried to the kidney from the bladder, prostate or seminal vesicles in the male, even though no obstruction exists in the lower urinary tract and the ureterovesical sphincter is intact. In the female a similar transport of organisms from the bladder to the kidney can occur. Bauereisen[9] has recently directed attention to the anastomosis of the lymphatics of the internal genitalia with those of the bladder and ureter. He believes that some of the cases of cystitis following gynecologic operations are due to this communication. In some of the experiments of our first series the tendency of the inflammatory changes to follow the course of the periureteral lymphatics was very striking. It is quite possible that the pyelitis of pregnancy and the puerperium may be due to the migration of organisms from the genitalia directly to the periureteral lymphatics without the presence of an accompanying cystitis. Our work would also offer the most plausible explanation for the pyelitis of infancy and childhood, which occurs predominantly in girls. Infection of the bladder in such cases from the vulvovaginitis, so commonly present, with ascending infection by way of the interstitial lymphatics of the ureter, can readily occur.

CONCLUSIONS

1. While infection of the bladder or lower ureter may reach the renal pelvis or the kidney either by way of the lumen of the urinary tract or by way of the mural lymphatics, experimental and clinical evidence indicates that complete or almost complete obstruction to the urinary outflow is necessary for ascent of infection by way of the lumen of the urinary tract.

2. We have shown experimentally that in the absence of complete obstruction the infection may and does pass upward from the bladder by means of the lymphatics of the ureteral wall.

3. Depending on the virulence of the organism and on the susceptibility of the host, the involvement may

9. Bauereisen: Ztschr. f. gynäk. Urol., 1914, **4**, 1.

remain limited to (1) the bladder and ureter, (2) it may pass upward to the pelvis, or (3) it may invade the renal tissues. When the kidney itself becomes involved, the inflammatory agent is carried from the renal pelvis to the parenchyma by the lymphatics of the intertubular and perivascular tissues.

4. In the human being the lymphatic network constitutes the most important path of ascending infection when pyelitis or pyelonephritis follows cystitis not associated with complete obstruction to the urinary outflow.

5. In the absence of cystitis the renal pelvis or the kidney itself may become involved by the transport of infection from the pelvic organs or from the lower intestinal tract through the anastomosing lymphatic channels, which anatomic study has shown to be present.

ABSTRACT OF DISCUSSION

DR. G. KOLISCHER, Chicago: Up to recent years it was believed and stated in a kind of axiomatic way that there were only two sources of renal infection, the hematogenous infection and the direct. Now it is demonstrated that micro-organisms may travel up into the kidney from the bladder, from the genitals, especially in the female, without being carried through the lumen of the ureter; they are carried through the lymphatics, without any obstruction, where the flushing from the kidney to the bladder is still intact. This will do away with the indifference shown in certain quarters toward infection of the genito-urinary tract, especially in women. It will be necessary to attend to all these processes in the lower genito-urinary tract in women very thoroughly, so as to prevent pyelitis, especially in women, and in pregnant women. We will be able to save many cases which would become infected and lost otherwise.

DR. E. O. SMITH, Cincinnati: Dr. Kretschmer has shown in his cystographic work that even normal bladders have regurgitation of fluid into the pelvis of the kidney; so we may still have infection going up the ureter without obstruction, and there may be pyelitis without obstruction anywhere along the line of the ureter. It has been demonstrated that the normal kidney will take care of a considerable amount of infectious material, and in order to have an infection of the kidney, even though it reaches the kidney through any one of the three routes, there must be something that is damaging that kidney. A normal kidney will take care of perhaps all that will go through this lymphatic tract. I would like to ask Dr. Eisendrath to explain just why these pelves become infected without an infection of the kidney by the infection carried through the lymphatic stream?

DR. EDWIN BEER, New York: I do not quite see how one can conclude that the infection started in the lymphatic channel and not within the ureter. I am firmly convinced that lymphatic infection along the ureter is very important. Yesterday Dr. Crabtree told me that in a series of about fifty cases of pyelonephritis they had a positive blood culture of colon bacilli in 30 per cent. I would like to ask Dr. Eisendrath whether he controlled his animals, took blood cultures, so as to disprove a hemic infection plus the lymphatic infection? My evidence of the importance of the lymphatic infection is in tuberculosis of the kidney. In the earliest types of tuberculosis of the kidney one may find, and I have seen it, the tuberculous ulcer starting in the notch which Dr. Eisendrath called attention to, the angle where the papilla is inserted into the kidney. I do not think many of us doubt, from the experimental work that has been done, that tuberculosis of the kidney is a hemic infection. The interesting point brought out by cases I have observed, in which the ureter is removed secondarily, is the fact that the microscopic examination of the ureter will show in the great majority of cases that the mucous membrane is intact, but that there is a lymphatic tuberculosis, a periureteritis. The question arises, Is there not an analogy between the tuberculous cases and the colon infections which would allow us to harmonize the results of the clinical observations of Cabot and Crabtree, and the experimental work of Eisendrath?

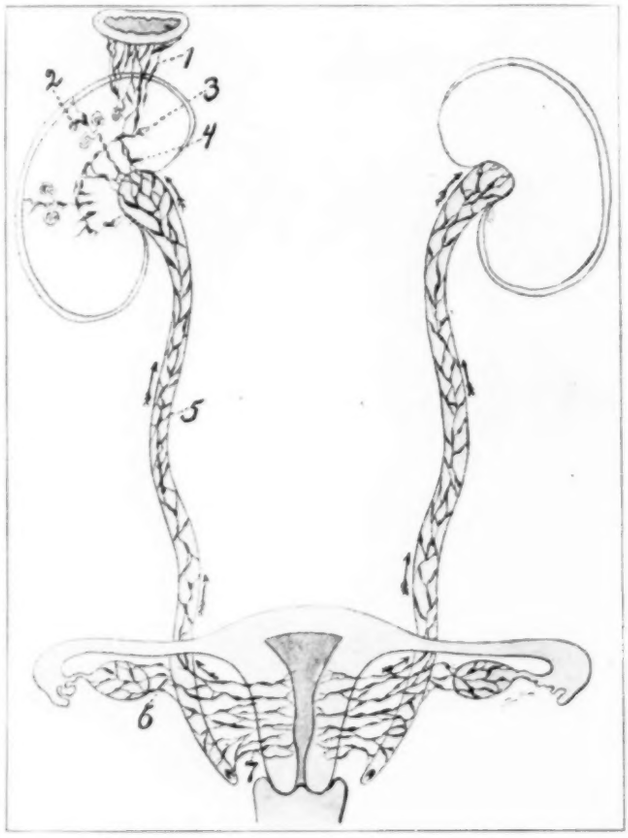

Fig. 3.—Relation of lymphatics of the ureter to those of the internal genitalia of the female and to the colon; 1, lymphatics from colon to cortex of kidney; 2, 3 and 4, periglomerular boundary zone and intertubular lymphatics of kidney (Kumita); 6, communication of periureteral lymphatics (5) with those of uterus, tubes and ovaries.

DR. IRVIN S. KOLL, Chicago: A few years ago I made bold to coin the expression "lymphomania," because I was afraid that our interpretation of the experimental work on kidney infection was becoming too reactionary. Some of my earlier kidney experimental work shows definitely that we are overestimating the importance of the lymphatic tract. There can be no doubt that the lymphatics carry a large percentage of the infections of the kidney from the lower urinary tract, but I can present a number of sections from the kidney that show definitely that we get a distinct glomerulitis without any evidence of round cell infiltration around the lymphatics.

DR. DANIEL N. EISENDRATH, Chicago: We made blood cultures on every known medium on every animal that was killed (they were killed with strychnin), in a thorough bacteriologic manner, and in not a single case did we find a positive culture from the blood. Furthermore, we made cultures from the urine in every case, and did not find a positive result in that. At necropsy, in addition to cultures from the blood, we made cultures from both kidneys and from the bladder, and in a number of these we recovered the same organism which we injected. Dr. Smith brought up a point which I am going to bring out in the paper; the longer an experiment lasted, the less did we see. In other words, it seemed that what we found was frequently not possible of clinical demonstration over eleven days after the animal became infected. We see first little traces of infection in the bladder, and perhaps up the ureter a few little cells, nothing else. My belief has always been that we seldom, if ever, get a pure pyelitis; that there is almost invariably an infection of the parenchyma of the kidney. I think Dr. Chute was one of the first to call attention to that. In regard to the ques-

tion which Dr. Beer raised as to the transmission within the kidney itself, I am becoming more and more convinced that after the infection once starts in a single place, it travels from that into the kidney itself. That is something we are working on now, the intrarenal lymphatics. That is the only way in which we can explain some of these cases in which there are five or six foci not connected with each other. I believe the same thing is true of tumors. If a hypernephroma starts in one portion of the kidney we can explain its spread to distant parts in that way. Dr. Koll stated that he found a glomerulitis and no evidence of inflammation. I cannot reconcile the two statements.

TWO CASES OF TRICHOPHYTOSIS BARBAE CURED BY THE USE OF STRICKLER'S RINGWORM VACCINE*

M. F. ENGMAN, M.D., AND R. A. MCGARRY, M.D., ST. LOUIS

Owing to the results obtained by the use of Strickler's ringworm vaccine[1] in two cases so treated, it is felt that their publication may be of stimulating interest. In undertaking the treatment of these cases, both of *Trichophyton megalosporon-ectothrix*, little hope was entertained that the results would be so striking, as the directions for use in the package kindly sent us by Dr. Strickler stated that practically all the cases in which it had been used were of the microsporon type.

The patients under discussion were both Italians, swarthy, with coarse skins and black, heavy beards.

CASE 1.—F. F., aged 22, freight handler, with negative physical examination, first became aware of the trouble four weeks previous to his entrance into the hospital. A small pustule appeared on the lower lip. This was soon followed by others, and the disease rapidly spread over the entire bearded region of the face (Fig. 1). Various remedies were tried, with no result.

Fig. 1.—Before use of vaccine.

With the exception of the small area around the mouth and that just in front of the ears, the entire bearded region of the face and neck was involved, and there was a similar area on the left forearm. The beard was long and had not been shaved for two weeks. The face was swollen. There was some redness, with local edema, and the lesions were all infiltrated, particularly in the submental region. A large number of yellow pustules involving the hair follicles covered the entire face. In some places they were clumped into little tumors or nodules. The hairs were so easily extracted that they came out with the plain petrolatum dressing.

Fig. 2.—After use of vaccine.

CASE 2.—S. C., aged 27, laborer in a spaghetti factory, could impart little of his history, as he only spoke an Italian patois. Physical examination was negative. It was learned later that two other males in the family had similar trouble.

On entrance to the hospital, the right side of the face was greatly swollen, with a suggestion of abscess formation at a point just inferior to the angle of the jaw. Considerable inflammation and a slight amount of induration were present. Minute pustules were noted around the base of the lesion and scattered over it, pierced by a hair. An area about the size of a half-dollar had become almost denuded of hairs in the tip of the tumor, and the pus came from some of the follicles in this area. Around the border of the clear area were small verrucose growths, giving it a cobblestone appearance.

Microscopic examination of both cases disclosed the *Trichophyton megalosporon-ectothrix* fungus.

Both patients remained in the hospital throughout the treatment. Nothing was applied locally except plain petrolatum. The period between injections was six days. All injections were made subcutaneously between the scapulae.

Patient 1, March 18, was given an initial dose of a full ampule, 2 c.c., of the vaccine as prepared by Dr. Strickler.

March 21, the temperature of the patient was 100 F.; March 23, normal. On the evening of this day, however, the patient complained of a severe pain in the upper right abdominal quadrant. The temperature rose to 100.5 F. The surgeon was called in consultation, and a diagnosis of acute cholecystitis was made. Hot packs and the usual remedies were applied, and the patient immediately recovered.

He was given a second ampule, March 28, when the face began to improve. The inflamed appearance had markedly decreased and the edema had subsided.

May 13, the patient was dismissed cured, there being no evidence whatever of the disease (Fig. 2). Six injections, in all, were administered.

Patient 2 was given an initial dose of 2 c.c. of Strickler's vaccine, March 18.

There was a slight local reaction. March 21, the temperature rose to 101 F. and gradually subsided by March 24.

* From the Barnard Free Skin and Cancer Hospital.

1. Strickler, Albert: The Vaccine Treatment of Ringworm of the Scalp, THE JOURNAL A. M. A., July 17, 1915, p. 224.

There seemed to be some increase in the swelling, the tissues felt more infiltrated, and the patient complained of considerable pain.

The second injection was given March 24, after which no reaction followed. Improvement had, however, already appeared in the lesion. The swelling was gradually subsiding, March 30, when the last injection was given.

The patient was discharged, May 13, entirely free of the disease.

The results in these two cases have been striking and, of course, far superior and far more quickly obtained than by any other method we have heretofore used.

DECOMPRESSION CRANIOTOMY IN BULLET WOUND OF BRAIN AND HEMIPLEGIA

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Associate Neurologic Surgeon, Polyclinic Medical School and Hospital

History.—D. M., man, aged 74, born in Ireland, of small stature, weight 120 pounds, was brought to the Polyclinic Hospital in the evening of Jan. 16, 1916. He was perfectly conscious, and gave his history frankly without showing any great excitement or any evidences whatever of shock. He said that two men entered his small basement store and at the point of a revolver demanded money. He gave them what he had, and in leaving, one of them fired at him, striking him in the face just below the left eye. Almost immediately he lost the sight of the left eye.

Examination.—Just below the left eye was a small ragged wound, the size of a bullet, from which blood was freely oozing. There was also considerable hemorrhage from the left nostril. This was controlled by packing the nose with gauze, but even then it continued to ooze for two or three hours afterward. The temperature was 99, pulse 85, respiration 20. The left pupil was widely dilated, and did not react to either light or accommodation. The wound was thoroughly cleansed, and with a probe, the course of the wound was determined to be upward and inward to the orbital bone. No further attempt was made to locate the bullet. For drainage a small piece of folded rubber tissue was inserted into the wound and a sterile dressing applied. Three thousand units of tetanus antitoxin as a prophylactic

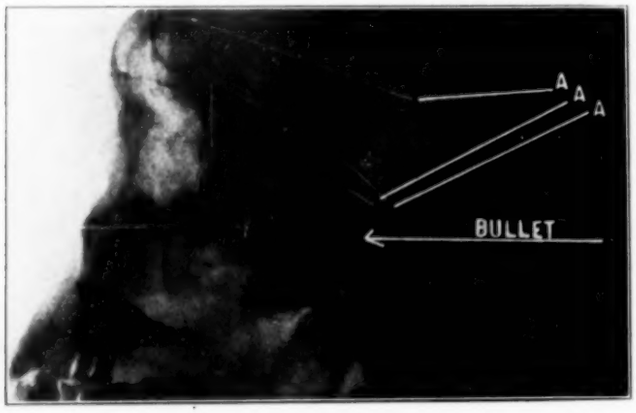

Fig. 1.—Location of bullet, and fragments along its course. *A, A, A,* silver wireclips placed over branches of middle meningeal artery in the dura at the time of operation.

dose were given intramuscularly, after which the patient was admitted to the ward on the service of Dr. William Sharpe.

The following morning, January 17, we found the patient with a complete right-sided hemiplegia. There were no signs of aphasia; there were a Babinski reflex of the right foot and beginning signs of medullary compression. The temperature was 100, pulse 60, respiration 16.

The cerebrospinal fluid by lumbar puncture was found by measurement under pressure and blood tinged.

Ophthalmoscopic examination revealed slight obscuration of the optic disk of the right eye, more marked on the nasal half.

These signs were present: 1. Hemiplegia of right side. 2. Beginning signs of medullary compression, as evidenced by lowered pulse rate, rise in temperature and diminished respiration. 3. The cerebrospinal fluid under pressure, shown by lumbar puncture and ophthalmoscopic findings.

The combined symptoms and signs of hemorrhage on the brain, together with other clinical signs, were also positive.

Fig. 2.—Patient, Oct. [illegible], 1916, aged 75.

Operation.—I performed a left cranial decompression. A vertical incision was made in the skin from a point just above the zygoma, on the left side about one-half inch anterior to the external auditory meatus upward about 3 or 4 inches to the middle of the parietal crest. The temporal fascia and muscle were incised longitudinally and retracted, care being taken not to tear away the attachment of the muscle to the parietal bone and thereby weaken its closure. With a Doygen perforator and burr a small opening was made in the lower and thinnest portion of the squamous portion of the temporal bone. With rongeurs the bone was cut away as far back as the retracted muscle would permit, in an oval shape to the diameter of 2 or 3 inches. The dura appeared tense and distinctly bluish underneath. When it was incised, quite a quantity of free dark blood escaped, but no clots were found. After the flow of blood ceased there was no evidence to be seen of any injury to the cortex. No attempt was made to search for the bullet (the location of which is shown in Figure 1). The dura was opened in a stellate manner and left so. A folded rubber tissue drain was placed in the lower angle of the wound subdurally into the middle fossa, then muscle, fascia and skin were securely sutured. Sterile dressing and roller gauze bandage were applied to the head and the patient returned to bed in good condition. The temperature was 99.6, the pulse 78, and the respiration 22.

Postoperative Course.—The wound healed by primary union. There was temporary incontinence of urine and feces. A discharge from the left eye ceased February 1. The left eye was totally blinded. There was no impairment of vision of the right eye. March 19, the patient was discharged with complete use of the right arm and hand; he still walked with the aid of a cane, but did not drag the foot. He has now passed his seventy-fifth birthday (Fig. 2), walks without a cane, is as mentally bright as before his accident, and continues to carry on his business—a small grocery store. He does not drag his feet, and has a firm grip to his right hand. The present weight is 118 pounds.

SUMMARY

The patient has always lived a temperate life, but his complete recovery, I believe, can be summarized as follows:

1. Prompt surgical relief of intracranial pressure before the onset of medullary edema with signs of compression or shock.

2. Release of subdural hemorrhage before any injury to the cortex from irritation by the formation of blood clots.

3. Selection of the subtemporal route with vertical incision for the decompression operation, thereby giving best opportunity for drainage and also perfect closure over the removed bone area.

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COAGULATION TIME OF THE BLOOD IN PNEUMONIA*

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AND
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A recent article in THE JOURNAL[1] on the coagulation of the blood in pneumonia seems to us rather misleading, not only in its deductions but also in the methods employed.

Anders and Meeker determined the coagulation time by obtaining blood from puncture of the ear or finger. Any such method of obtaining blood for determining the coagulation time is so clearly open to error that it should be discarded. While the method of obtaining blood by venous puncture and allowing it to clot either directly or by recalcifying the oxalated plasma at room temperature in glass tubes evidently intrudes artificial conditions, which doubtless interfere somewhat with accuracy, nevertheless it can be emphatically stated that the obtaining of blood by rapid venous puncture is a necessary step in making observations of any value on the coagulation time of the blood.[2]

The main reason for insistence on this point is that all tissues contain a substance (tissue juice, thrombokinase, thromboplastin, cytozyme, etc.), which is a potent factor in coagulation and is similar to the action of the blood platelets, which markedly hasten coagulation of the blood. For the purpose of determining coagulation time, blood should be obtained in as near the natural state as possible, so that the platelets, etc., are not unduly altered or the initial stages of coagulation unduly hastened. Tissue puncture of the ear or finger necessarily introduces some of the "tissue juice" into the blood and allows the blood to be unnecessarily altered and thus vitiates observations of coagulation time.

Lee and White,[3] among others, have already shown that a normal coagulation time of blood from the ear is of no significance unless delayed. We have repeatedly observed a normal coagulation time when blood was obtained from the ear, but a delayed time when blood was properly obtained from a vein. In cases of hemophilia, for example, blood from a vein showed a marked delay in its coagulation time, while blood from the ear frequently clotted in normal time. There is, of course, no doubt that the true coagulation time is usually markedly prolonged in true hemophilia. From such observations it seems clear to us that the coagulation time should always be determined with blood drawn by a clean puncture of a vein rather than with blood by puncture of the skin with the inevitable introduction of additional coagulating factors.

Anders and Meeker[1] found the coagulation time of the blood in pneumonia shorter than normal before the crisis and essentially normal after it. On the other hand, other workers, and particularly Dochez,[4] to whom they make no reference, showed quite the reverse condition. Dochez found during the disease usually a delay, never a shortening in the coagulation time, which became normal shortly after the crisis. Dochez suggested that, together with the recognized increased fibrinogen in the blood in pneumonia, there might be an increase in antithrombin to account for the delayed coagulation time. Dochez used a careful and excellent technic for determining the coagulation time of the blood, which was drawn from a vein. Our results from a study of twenty cases (six previously reported[5]) which were obtained by a similar though cruder method[3] in that ordinary small glass tubes were used and the observations were made at room temperature, are entirely in accord with those of Dochez. We never found the coagulation time less than normal. It was nearly always delayed, at times quite markedly so, more usually in very sick patients. The coagulation time became essentially normal shortly after the crisis. Our figures show variations from six and one half to thirty-eight minutes, usually from fourteen to eighteen minutes for the coagulation time in the cases of pneumonia before the crisis. A long series of normal controls vary between five and ten minutes.

Our observations have not as yet reached a point at which we feel that we can state positively the exact nature of the interference with the normal complicated mechanism of coagulation which prolongs the coagulation time in pneumonia. We have, however, made the following observations on the blood in pneumonia: The clots retracted in apparently normal fashion. Some clots retracted rather weakly, coincident with a diminished number of platelets. The reclotting phenomenon was observed in three cases in which a marked delay in the coagulation time was noted. This reclotting phenomenon in the blood of pneumonia is quite similar to some other observations (reported[5] and unreported) in other groups of cases which showed a delayed coagulation time. The red cells in the oxalated plasmas of our cases settled out with remarkable rapidity, and this also frequently occurred in the whole blood, as shown by the white character of the upper part of the clot even in those bloods which clotted in but slightly delayed time. This phenomenon is perhaps associated with an altered viscosity of the blood. In twelve of our cases the prothrombin time[6] (the time required for a given amount of oxalated plasma to clot in the presence of the optimum amount of calcium) was estimated and, like the coagulation time, was usually delayed, although our impression is that it was usually relatively less delayed than the coagulation time.

The optimum amount of calcium required to determine the prothrombin time was the same for the pneumonia plasmas as for the controls, thus illustrating that there was ample available calcium for the purposes of coagulation.[7] The antithrombin, determined by a modification of Howell's method,[8] was usually normal, in some cases high, and rarely slightly diminished. These variations are unexplained. They did not occur in any definite relation to the prothrombin time or the coagulation time. The fibrinogen was increased, as has often been observed. In three instances in which we found the antithrombin normal but the prothrombin time and coagulation time delayed, it was noted that the oxalated plasmas of the pneu-

* From the Medical Service of the Massachusetts General Hospital.

1. Anders, J. M., and Meeker, G. H.: Coagulation Time in Lobar Pneumonia, THE JOURNAL A. M. A., Nov. 25, 1916, p. 1591.
2. Howell, W. H.: The Condition of the Blood in Hemophilia, Thrombosis and Purpura, Arch. Int. Med., January, 1914, p. 76. See also Footnotes 3 and 4 and other references given there.
3. Lee and White: Am. Jour. Med. Sc., 1913, **114**, 495.
4. Dochez, A. R.: Jour. Exper. Med., 1912, **16**, 692.
5. Minot, G. R., and Lee, R. I.: The Blood Platelets in Hemophilia, Arch. Int. Med., October, 1916, p. 474.
6. Minot, G. R.; Denny, G. P., and Davis, Daniel: Prothrombin and Antithrombin Factors in the Coagulation of Blood, Arch. Int. Med., January, 1916, p. 101. Minot, G. R.: Jour. Med. Research, 1916, **33**, 503.
7. Minot, Denny and Davis (Footnote 6), Lee, R. I., and Vincent, Beth: The Relation of Calcium to the Delayed Coagulation of Blood in Obstructive Jaundice, Arch. Int. Med., July, 1915, p. 59.
8. Minot, Denny and Davis (Footnote 6).

monia blood clotted slightly faster than the control plasmas when equal suitable amounts of either a fresh suspension of blood platelets or kephalin (active thromboplastic substance) solution were added with appropriate amounts of calcium. One possible explanation is that with the excess of fibrinogen there is presumably some other altered relationship in the character or amount of other coagulating factors, so that when any one substance which accelerates the coagulation is introduced into the plasma, the initial stage of coagulation is more readily started or more quickly completed.

Furthermore, with perhaps an excess or altered character of the factors entering into the late stages of coagulation in which fibrinogen participates, the complete coagulation time is shortened. Such might explain the results obtained by Anders and Meeker, since by their technic there must have been introduction of some "tissue juice" and some undue modification of the platelets. Under these circumstances, the first stages of coagulation were perhaps completed in normal fashion, and the later stages were permitted to proceed more rapidly than normal. This would suggest that in the blood in pneumonia there may be a lack of the substance akin to "tissue juice," or increased need of it. With the methods used by Duchez and ourselves, there is much less interference with the initial stages of coagulation, and consequently we have found the coagulation time quite constantly delayed in our cases of pneumonia.

A few words in regard to the rôle of calcium may not be out of place, since Anders and Meeker discuss the rôle of calcium in coagulation.

The importance of calcium in coagulation has long been recognized. Because calcium can be readily administered, it has been used widely as a therapeutic agent in all sorts of pathologic hemorrhage. There is much confusion concerning the efficiency of calcium therapy. Most of the reports are without value, as they are either frankly clinical or depend on tests of coagulation time of blood taken through the tissues. In observations of pathologic coagulation of blood, at the bedside, in experimental animals and under all sorts of abnormal conditions in the test tube in the laboratory, we[7] have so far been able to ascribe only one condition of abnormal coagulation time of clinical significance to a lack of calcium. The condition is common in obstructive jaundice of several weeks' duration. In this condition the amount of calcium is actually increased, but there seems to be insufficient calcium available for purposes of coagulation. This lack of available calcium can be corrected by the administration of large doses of calcium salts clinically, in the test tube and in experimental animals.

CONCLUSIONS

The determination of coagulation time of blood is at best uncertain under the necessarily artificial conditions of any test. Determination, however, of the coagulation time of blood obtained by neat technic from venous puncture seems to be reasonably accurate. Observations of coagulation time of blood taken through the tissues is obviously unreliable. The coagulation time of blood in pneumonia is generally prolonged. The deduction on the basis of tests made by ear puncture that the coagulation time of blood in pneumonia is shortened is unwarranted.

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DOES THE SPINAL FLUID FROM HUMAN POLIOMYELITIS CONTAIN THE SPECIFIC INFECTIVE AGENT?*

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Repeated attempts to demonstrate the virus of poliomyelitis in the spinal fluid of human poliomyelitis both by cultures and by animal inoculation have all proved negative. Flexner and Lewis[1] have demonstrated its presence in the spinal fluid from an infected monkey drawn three days after the time of the intracerebral injection of virus. This fact suggests that it may be present in the fluid at some stage of the incubation period. If it is present, it is probable that it diminishes rapidly with onset of the symptoms, but may not wholly disappear. It is possible that the virus is present in the later stages in such minute quantities that it cannot be demonstrated by animal inoculation.

Nuzum and Herzog[2] have recently reported the finding of a gram-positive coccus in 90 per cent. of the spinal fluids from positive cases of acute poliomyelitis. This organism was isolated with apparent ease, even from spinal fluids withdrawn several weeks after the onset of paralysis. The organism was grown under aerobic conditions and subcultures grew readily on glucose agar slants.

During the epidemic in New York City, this laboratory cultured upward of 1,200 fluids from patients with acute poliomyelitis in all stages of the disease. The medium used was 1 per cent. glucose ascites agar under aerobic conditions. Except for a few evident contaminations, our cultures remained sterile.

The experiment here recorded was undertaken to determine whether or not the aggregate of a number of spinal fluids from positive cases of human poliomyelitis contains sufficient virus to infect a monkey.

The fluids from forty patients with poliomyelitis were centrifuged at high speed for three quarters of an hour. As our clinical work consists chiefly of the diagnosis of suspicious cases, these fluids were derived from cases early in the disease, most of them in the preparalytic stage. The sediments, amounting to 1 c.c. of very turbid fluid, were injected intracerebrally into Rhesus 23. Culture tubes of glucose ascitic agar inoculated with some of the sediment remained sterile.

No effects were noted, and after an observation period of two months, this animal was inoculated with 0.5 c.c. 10 per cent. suspension of VII gen. monkey virus. After an incubation period of eleven days, paralysis appeared in the left leg. The paralysis then involved the right leg but failed to progress further. The animal is alive and improving.

CONCLUSION

It would appear from the foregoing experiment that there is present little, if any, virus demonstrable either by culture or animal inoculation in the fluids of human poliomyelitis in the early stages.

216 East Fifteenth Street.

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* From the Bureau of Laboratories, Department of Health, City of New York.

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LONG NITROUS OXID-OXYGEN ANESTHESIA: REPORT OF CASE

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The opinion seems to prevail among those who have had no experience with "gas" anesthesia that it is useful only in minor surgery, for operations requiring only a brief anesthesia, and for operations of necessity on patients who cannot withstand the depression or acidosis produced by ether or chloroform. Those who have done considerable operating under nitrous oxid-oxygen anesthesia know this opinion to be a fallacy. Almost any operation can be done under it, and it should unquestionably be the anesthesia of choice where there is the least possibility of the patient's chances of recovery being lessened by operative shock or postoperative depression or acidosis. Cases in which it has been used in major surgery for operations of from one and a half to three hours are by no means rare. A few cases of four hours' duration have been reported. But as far as my search of the literature has disclosed, there is no case on record as long as the one herewith reported—four hours and forty minutes.

REPORT OF CASE

History.—Mrs. H., aged 72, well developed, admitted May 2, 1916, had acute intestinal obstruction. A diagnosis of carcinoma of the sigmoid was made. The cecum was enormously distended with fecal matter. Cecostomy and appendectomy were done under nitrous oxid-oxygen; the operation lasted ninety minutes, and anesthesia was uneventful. The patient was discharged, May 13, with an artificial anus. Since then she had had complete obstruction of the lower bowel. She was readmitted, October 9, for sigmoidectomy and closure of the fecal fistula. Operation was performed, October 10, under nitrous oxid-oxygen anesthesia, preceded by morphin sulphate, 1/6 grain hypodermically. An incision in the left lower quadrant was "blocked" by novocain, 1:400, and quinin and urea hydrochlorid, 1:500. Sigmoidectomy was performed with great difficulty, and then a lateral anastomosis of the colon. The incision was closed. The old cecostomy wound was then opened without "nerve block," and portions of the cecum and ileum were found to be bound in an indescribable mass and riddled with sloughed openings. It was necessary to perform three separate anastomoses, removing as many portions of the bowel.

Anesthesia.—Induction proved a trifle difficult, owing to spasm of the jaws and unfavorable condition of the teeth. This rendered breathing difficult and unsatisfactory until relieved by insertion of a Ferguson-Hewitt artificial airway, after which respiration was quiet and even. Operation was begun five minutes after the anesthetic had been started. Three and one half ounces of ether were used throughout the four hours and forty minutes, being administered with the gases at irregular intervals, chiefly during the early part of the first stage of the operation, to secure greater relaxation of muscles. The patient's color remained good throughout (after insertion of the airway), and the highest respiration rate was 32. The preanesthetic pulse was 84, and the rate did not go above 100 until the last half hour, being 116 immediately after the anesthetic. No stimulants were employed until within fifteen minutes of the end of the operation, when 20 drops of camphorated oil were given, followed in five minutes by 1/6 grain of morphin sulphate. There was only occasional retching and no vomiting, except once immediately after the anesthetic was removed. The patient was conscious and replied to questions five minutes after.

Postoperative Course.—The patient left the operating room at 3:10 p. m.; the pulse was 116, and respiration 26. The feet and legs were slightly cold and cyanotic, though the entire skin was dry. At 4 p. m., the patient complained of dyspnea. Atropin sulphate, 1/100 grain, was given hypodermically. The patient complained of being too warm.

At 4:25 p. m., the pulse was 112, and respiration 20. Oxygen inhalation was given for five minutes.

At 5 p. m., the pulse was 114, respiration 20, and temperature 97. The color and skin condition were good. From this time to 11:30 the patient continued in remarkably good condition. Just before midnight the pulse became rapid and thready, respiration progressively labored, and temperature rising. From then on there was only brief response to stimulation, and symptoms suggested acute cardiac dilatation. Death occurred at 5:30 a. m.

COMMENT

In just what degree, if any, the long anesthesia contributed to the fatal termination can only be conjectured. The case is cited to show that long sustained nitrous oxid-oxygen anesthesia is feasible, and that difficult operations can be performed under it which could not be completed under ether or chloroform.

DELIVERY UNDER GAS AND OXYGEN OF TWO PATIENTS WITH LOST CARDIAC COMPENSATION

W. T. GETMAN, M.D., BUFFALO

CASE 1.—Mrs. E. S., aged 32, sextipara, had had measles when a child, no illness since, and no history of rheumatism or infectious disease. For three years she had been troubled with dyspnea and swelling in her limbs so that it was difficult to do her housework. For the past seven months she had been unable to walk, or to sleep except when sitting up. Edema increased steadily.

Examination on admission to the Buffalo General Hospital revealed great edema of the feet, legs, thighs, vulva, abdomen and face. The heart was dilated and very irregular. The apex beat was just outside the anterior axillary line. A systolic murmur was heard over the entire cardiac area. The hemoglobin was 58 per cent. The urine showed a trace of albumin and a few granular casts. A diagnosis of mitral insufficiency with lost compensation, was made.

The patient had been pregnant eight and a half months. She had had no difficulty in her five previous labors, and her pelvic measurements were normal. For nine days after admission she was in the medical ward in the service of Dr. De Lancey Rochester, and by the Niemeyer pill and strychnin the edema was somewhat reduced and the dyspnea slightly improved, though she still had to sleep in the sitting posture.

When her labor commenced she was transferred to the obstetric service. She stood the first stage pains fairly well, but when expulsive efforts began at the end of dilatation, she became cyanosed and almost pulseless. I decided on version and extraction, and as ordinary anesthesia was out of the question, she was brought to the end of the delivery table in a sitting position, nitrous oxid and oxygen were administered, and she was delivered of a full term living child in five minutes by version. She stood the gas and oxygen nicely, and in the week following improved rapidly, being able to sleep lying down and having little dyspnea. On the ninth day after confinement, while perfectly quiet, she suddenly developed acute cardiac dilatation, and died six hours later.

McKenzie states that a pregnant woman with lost compensation is in danger of acute dilatation for at least two weeks after delivery.

CASE 2.—Mrs. N. B., aged 43, primipara, had had a mitral regurgitation for five years. She had attacks of cholecystitis at intervals. Eleven years before she had had a ventral suspension done for retroversion. For three months she had noticed edema of the feet and legs, and had had to sleep sitting up on account of dyspnea.

The heart was dilated and irregular. The apex beat was 1 inch outside the nipple line. The child was lying in the transverse position, probably on account of traction on the fundus from ventral suspension. As the patient was a primipara, version and extraction could not be considered, and cesarian section under gas and oxygen seemed the safest.

Three days before her estimated date of confinement, I did a high Davis operation and delivered a living full term child. The operation was completed in thirty-five minutes under light gas and oxygen anesthesia, and the patient made an uneventful recovery, leaving the hospital in two weeks.

I am reporting the delivery of these two patients under gas and oxygen as I think neither patient would have survived an ordinary labor with any of the anesthetics ordinarily used.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(Continued from page 461)

NEPHRITIS

DISTURBED FUNCTION IN NEPHRITIS

Aschoff[72] states that the majority of primary contracted kidney cases develop as a result of vascular disturbance, "a sclerosis of the finest branches of the renal artery beginning relatively early in life and leading secondarily to the formation of atrophic foci in the parenchyma and to hyaline degeneration of the glomeruli, with a resultant focal inactivity and atrophy of the tubules belonging to them." The whole process is slow and passive. This slowly developing sclerosis of the fine arteries of the kidneys causing typical Bright's disease is not similar to the arteriosclerotic kidney of later life, when aortic disease precedes it, as in the latter case some parts of the kidneys may not be involved. It is self-evident that the more filter tissue incapacitated by arteriosclerosis the more efficient must be the circulation in the healthy parts of the filter. Hence the high blood pressure, cardiac hypertrophy and polyuria is nature's compensatory mechanism. Furthermore, the healthy glomeruli of the kidneys may hypertrophy so as to make the excretion from the kidneys sufficient without the assistance of the impaired sections.

In secondary contracted kidneys the previous history is that of an inflammation. In these cases the whole kidney filter is involved and the kidneys cannot react to any emergency demand on them; hence edema and uremia frequently occur. Usually a diminished amount of urine is passed, sometimes resulting in polyuria. In this condition the metabolism is the same as in primary contracted kidneys, namely, there is increased blood pressure, etc.

Tests of function will show the ability of the recovered or still intact portions of the kidney to excrete, but do not show the excretory ability of the scar tissue. It has also been demonstrated by Baetjer[73] that in certain conditions of nephritis there may be not only a normal but also an increased eliminative power at some particular period. Hence one test, and even a repeated test with one substance, is not sufficient to demonstrate the health of the kidneys.

In the secondary contracted kidney the tubules connected with each diseased glomerulus gradually lose their power to function, to a greater extent than in primary contracted kidneys. The larger the number of glomeruli impaired or entirely incapacitated, the less the amount of urine excreted. The polyuria of hypertension and the consequent increased circulation in the unimpaired glomeruli should not be confounded with the polyuria caused by irritative toxins which injure the filter apparatus. Rapid impairment of normal function occurs in acute nephritis.

Oertel does not find that the amount of contraction of the kidneys bears any relation to the amount of cardiac hypertrophy.

Unless there is urea and nonprotein nitrogen retention in the blood, some other cause than kidney lesions is usually responsible for hypertension. Lead, once a common caus. of contracted kidneys, is now of little importance ordinarily, as workers in lead exercise more care than formerly. Accidental chronic lead poisoning, however, from water pipes, hair tonics, etc., is still not of uncommon occurrence, although this cause of chronic nephritis, arteriosclerosis or other systemic disturbance is probably many times overlooked.

Ophüls[74] says that subacute and chronic glomerulonephritis, in the majority of cases, is due to chronic sepsis; hence the danger, long unrecognized, of chronic infection of the mouth, nose and adjacent sinuses. After the study of a thousand necropsies, Ophüls reaches the conclusion that the amyloid kidney, subacute and chronic (the so-called large white kidney) is also the usual result of chronic sepsis.

An interesting estimate of the general resistant power of the system in the nephritis of acute infections is suggested by Carles and Mauriac,[75] namely, that the more serious the infection, the more fragile the leukocytes; also that leukocytes break down more readily in nephritis than in health. This difference in their fragility in nephritis and in health, with the same technic, they find to be 50 per cent. Consequently, even a mild complication of nephritis in acute infection makes the prognosis grave.

Probably all poisons act primarily on the different parts of the convoluted tubules, the resulting variations in function being due to the parts of the kidneys most affected and to the effect on the blood pressure.

PRACTICAL INTERPRETATIONS OF EXPERIMENTAL NEPHRITIS

Uranium is perhaps the irritant most frequently used to produce experimental nephritis. Fitz[76] has shown that in acute uranium nephritis in rabbits the excretion of amylase is reduced and the nonprotein nitrogen of the blood is increased during the inflammation, but that the excretion returns to normal as the kidneys heal.

Mosenthal[77] has shown that all grades of nitrogen retention may be caused by varying the dose of uranium. With large doses the nitrogen excretion is diminished. With small doses the nitrogen not only may remain normal, but even may be increased. This he thinks may be due to the irritant causing a greater destruction of nitrogen in the body. He believes that a greater excretion of nitrogen by the intestine does not necessarily mean a vicarious elimination, representing, perhaps, only an increased nitrogen metabolism. The nitrogen output in the urine may be decreased even when the bulk of urine passed is sufficient. This seems to indicate that nitrogen is excreted by the convoluted tubules, but does not prove that the circulation of the glomeruli is not disturbed in uranium nephritis.

Underhill,[78] and later Underhill in collaboration with Wells and Goldschmidt,[79] showed that subcutaneous injections of sodium tartrate caused degeneration of the tubular epithelium. From later experiments he concludes that the convoluted tubules excrete urea, and that the glomeruli excrete chlorids and water.

72. Aschoff, Ludwig: The Pathogenesis of the Contracted Kidney, Arch. Int. Med., December, 1913, p. 723.
73. Baetjer, W. A.: Superpermeability in Nephritis, Arch. Int. Med., June, 1913, p. 593.
74. Ophüls, William: Subacute and Chronic Nephritis as Found in One Thousand Unselected Necropsies, Arch. Int. Med., February, 1912, p. 156.
75. Carles and Mauriac: Jour. de méd. de Bordeaux, 1913, **43**, No. 18.
76. Fitz, R.: The Relation Between Amylase Retention and Excretion and Nonprotein Retention in Experimental Uranium Nephritis, Arch. Int. Med., April, 1915, p. 524.
77. Mosenthal, H. O.: Nitrogen Metabolism and the Significance of the Nonprotein Nitrogen of the Blood in Experimental Uranium Nephritis, Arch. Int. Med., December, 1914, p. 844.
78. Underhill: Jour. Biol. Chem., **12**, 115.
79. Underhill, Wells and Goldschmidt: Jour. Exper. Med., **18**, No. 4.

Oertel,[80] in reviewing the subject of experimental nephritis, finds that when the sodium chlorid excretion is interfered with the urine concentration is low; when there is a diminished amount of urine excreted lactose excretion is slow, but sodium chlorid and potassium iodid excretion is normal, and in these instances the trouble is largely vascular; and when there is polyuria there is vascular hypersensitiveness.

More recently Myers, Fine and Lough[81] have studied the retention of creatinin, uric acid and urea in the blood in nephritis, and conclude that a uric acid retention without urea or creatinin retention shows early interstitial nephritis. Later in the disease urea is retained, and still later, creatinin. Kraus[82] had already shown that creatinin is more or less retained in acute uranium nephritis.

Frothingham, Fitz, Folin and Denis[83] found that in uranium experimental nephritis the excretion of phenolsulphonephthalein and the nonprotein and urea retention in the blood followed the course of the inflammation and returned to normal when the kidneys healed, and varied with the amount of kidney tissue involved. The recovery of the permeability of the kidneys to phenolsulphonephthalein may be rapid in this experimental nephritis, the test showing the condition of the kidneys at that particular period; but nonprotein nitrogen and urea may be much longer retained in the blood, and consequently the blood test for nonprotein nitrogen is a more positive indication of the condition of the kidneys.

Other poisons used in causing experimental nephritis or which accidentally cause acute irritant nephritis are chromium, mercuric chlorid, cantharides, croton oil, sodium arsenate and crotalus venom.

Without edema there is probably no retention of chlorids.

It seems to have been demonstrated[84] that, in experimental nephritis, diuretics, even the simplest, are irritant and harmful to the kidneys, and even if there is temporarily an increased output of urine and solids, there soon is a diminution of this output, and the lives of the animals are shortened. This coincides with the clinical findings that in most cases of nephritis, certainly in all cases of acute exacerbations in chronic nephritis and in acute nephritis, diuretics are harmful.

It seems to have been demonstrated that anything which increases the creatinin of the blood in nephritis, as muscular exertion or physical strenuosity, or infection or fever, adds to the danger from the kidney disease.

Brown[85] showed that hematin poisoning of the kidneys may occur during severe malarial intoxication, and that all grades of degeneration of the tubular epithelium may occur, with albumin, casts and blood in the urine.

Leopold and Bernhard[86] find that the nonprotein nitrogen of the blood, and the phenolsulphonephthalein test have the same values during health and in renal disease in children as in adults.

Zondek[87] believes, after carefully studying children with nephritis and with orthostatic albuminuria, that if the nephritis is of the vascular type and the glomeruli unable to excrete sodium chlorid and urea, the tubules assume this extra work. Hence, if the intake of salt is reduced, the tubules are better able to attend to excretion of nitrogenous substances; therefore, in glomerular inflammation, that is, vascular disturbances, it is not necessary to exclude nitrogen and salt from the diet at the same time. In other words, if proteins are temporarily excluded from the diet, a little salt may be allowed. Zondek found that by excluding salt the residual nitrogen of the blood was greatly reduced. These findings suggest variations in diet.

O'Hare[88] has studied the excretion of sodium chlorid, nitrogen and water in nephritis. In normal individuals he found that on an increased sodium chlorid and nitrogen diet the urinary excretion became normal in forty-eight hours, but with diseased kidneys it may not return to normal in this period. He finds that the excretion of sodium chlorid generally is impaired in nephritis before there is much disturbance of water or nitrogen excretion. The excretion of nitrogen is greatly impaired only in severe cases. Excretion of sodium chlorid, water and nitrogen may be impaired in mild cases, even with normal phenolsulphonephthalein excretion and normal nonprotein nitrogen of the blood.

ANESTHESIA AND KIDNEY FUNCTION

It should be remembered that renal function as evidenced by one test of the phenolsulphonephthalein output is not sufficient, as this varies daily in a given patient. If the phenolsulphonephthalein was markedly retained, one test would be sufficient as indicative of the condition of the kidneys, as far as anesthesia was concerned. In advanced age the excretion of phenolsulphonephthalein is slower than normal, and this should be considered in operations on the aged.

Renal function as estimated by the phenolsulphonephthalein test has been found by Miller and Cabot[89] to be generally decreased in operations under ether, and is especially decreased after laparotomies. The decrease is best noted in the first twelve hours after the operation, and the more ether used and the longer the operation, the greater the decrease in the excretion of phenolsulphonephthalein, even to total inhibition in some instances. Shock (low blood pressure) caused a marked decrease. The lower the vitality of the patient, as from some serious condition like cancer, the more sluggish the phenolsulphonephthalein output. They found no definite relation of the decrease of phenolsulphonephthalein excretion to postoperative albuminuria.

Slemons and Morriss[90] have shown that the rest nitrogen is increased in both maternal and fetal blood after chloroform anesthesia.

(To be continued)

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85. Brown, W. H.: The Renal Complications of Hematin Intoxication and Their Relation to Malaria, Arch. Int. Med., September, 1913, p. 315.

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87. Zondek: Ztschr. f. klin. Med., 1915, **72**.

88. O'Hare, J. P.: Study of Salt, Nitrogen and Water Excretion in Nephritis, Arch. Int. Med., June, 1916, p. 711.

89. Miller, R. H., and Cabot, Hugh: The Effect of Anesthesia and Operation on the Kidney Function, as Shown by the Phenolsulphonephthalein Test, Arch. Int. Med., March, 1915, p. 369.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

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SATURDAY, FEBRUARY 17, 1917

THE VENTILATION OF THE LUNGS IN PNEUMOTHORAX

In his well known essay on the factors of safety in the living organism, Meltzer[1] called attention to Nature's extravagance in furnishing most of the important organs with a large surplus of tissue above the amount necessary to perform their ordinary physiologic tasks. This provision is a great blessing, serving to avert many a disaster which might follow impairment or a greater scantiness of functional matter. Meltzer reminded us that life may continue though a great part of the lungs is destroyed, if only the disease which caused the destruction comes to a standstill. In some cases of pneumonia one lung can be entirely consolidated without seriously impairing the process of ventilation. Furthermore, a patient whose thorax is freely opened to evacuate a one-sided pleural abscess has less dyspnea after the opening than before. In empyema, as in pneumonia, it is essentially the infection and intoxication with their reactions which cause the apparent disturbance in the respiratory mechanism, and not so much the mechanical interference with the ventilation of the corresponding lung. Since the classic experiments of Regnault and Reiset, many investigators have stated that compression of one lung, or a unilateral pneumothorax, exerts little influence on the respiratory exchange of gases.

An even more specific and, so to speak, quantitative study of this question has been reported in connection with an attempt to find out on man what effect a great reduction in the functioning lung surface would have on the various factors of respiration. The observations were made in persons with pneumothorax by Means and Balboni[2] at the Massachusetts General Hospital, Boston. They make it evident that at rest all the factors of respiration, gaseous exchange, carbon dioxid tension, and the mechanical factors, are normal in persons with a collapsed lung; that the well known reaction to carbon dioxid resulting in more rapid breathing is normal up to the point at which respiration is trebled or sometimes quadrupled; but that beyond this point a limit may be reached.

Here again is clear evidence that the ventilation of the lungs can be accomplished in an entirely normal manner in spite of a greatly reduced vital capacity. One lung is as efficient as two except when an increase at least threefold in contrast with normal ventilation is called for. Means and Balboni have shown as the only difference between normal persons and persons with a collapsed lung that the latter when called on to increase their ventilation reach their limit a little sooner than the former. Furthermore, the histories of patients bear out what might be expected in view of the foregoing, namely, that there will be no dyspnea in pneumothorax except after moderate exertion. Thus does the liberal surplus of functional tissues prevent disease from hampering our activities or spoiling the pleasure of living.

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THE VENEREAL DISEASE PROBLEM—III

The English Venereal Disease Act

The order of July 12, 1916, of the Local Government Board puts in operation in England and Wales a system of state provisions for the diagnosis and treatment of venereal disease. This order is practically an enactment into law of the recommendations of the Royal Commission on Venereal Diseases.[1] Its detailed provisions so closely follow the recommendations of the commission that a consideration of them would be but a repetition of the analysis of the recommendations. The essential purpose of the order is to furnish, as a sanitary measure, universal opportunity for prompt diagnosis and treatment of the venereal diseases. The cost of this is to be met to the extent of 75 per cent. from the imperial treasury, and only 25 per cent. from local government funds. Existing institutions are to be improved so that they can be utilized for this work, and new institutions are to be avoided as far as possible. The venereal clinics are to be a part of general clinics, and every effort is to be made to relieve the scheme of the stigma of the venereal diseases.

Facilities for diagnosis and treatment are to be furnished throughout England and Wales. The institutions are to be accessible, evening clinics are to be provided, and embarrassing or deterrent restrictions are to be avoided as far as possible. Treatment is to be given to all, regardless of their residence or means; but patients who are not objects of charity are to be referred, if possible, to private practitioners of their choice who, in conducting the treatment, are to receive the cooperation and advice of the medical officials in charge of the government clinics. Arrangements are to be made for supplying salvarsan or its substitute to

1. The Venereal Disease Problem—I, editorial, THE JOURNAL A. M. A., Feb. 3, 1917, p. 375; II, Recommendations of the British Royal Commission on Venereal Diseases, Feb. 10, 1917, p. 463.

practitioners for the treatment of their patients. The order shows evidence of appreciation of the importance of obtaining the cooperation of general practitioners, and of increasing the expert knowledge of venereal diseases among them. The clinics are to be made centers of instruction for practitioners and students.

Like the report of the royal commission, the order of the Local Government Board avoids radical steps. It is a measure which carefully takes into account the social conditions under which it must be operated. The privacy of the individual is not to be invaded. His secrets are to be protected. He is simply to be given universal opportunity for treatment, and every effort made to induce him to avail himself of it. The weak point of the plan, which apparently is unavoidable at present, is the fact that there are no adequate provisions for compelling attendance for treatment until the patients have passed beyond the contagious stage. This is a requirement which sooner or later must be embodied in state measures for the control of venereal diseases. The only body in the community which may regard the measure as a radical step is the medical profession. The measure is socialistic in its tendencies; but so are most measures for the public good, and it is fully justified on the ground of its general importance as a sanitary measure to the whole people. However much it tries to protect the private practitioner, it will tend somewhat to the sacrifice of his income. That is true of every measure for the control of infectious diseases. As past experience shows, this will not deter the medical profession in the end from giving the scheme its whole-hearted support. It will doubtless have opposition until it justifies its existence by its results.

The order is in many respects epochal. It marks the first effort of an English-speaking country or, indeed, of any large state, to deal with the venereal problem on a large scale by providing facilities for diagnosis and treatment. There is a vast difference between the state of public mind of so short a time as ten years ago, when it was impossible to get the English government even to appoint a commission to consider the venereal disease problem, and the state of public opinion today, which causes the government to put into the form of law the recommendations of a commission on venereal diseases within four months after its report is issued.

This act presents, under political and social conditions much like those of the United States, an organized effort by a state to reduce the prevalence of the venereal diseases by providing universal opportunities for treatment. As such its results will be of great interest to us. It may be said at once that the effort is well worth the making. Whether or not it solves satisfactorily the problem of the venereal diseases, it gives every prospect of being of sufficient benefit to justify its cost. It is to be hoped that it will obtain the support both of the medical profession and of the public to the extent necessary for its success.

UREA AND UREMIA

The observation that normally the kidneys can excrete very large quantities of urea without evidence of what has been regarded as renal "fatigue"[1] might well stimulate an inquiry as to whether urea itself can manifest toxic properties in the body. Now that it is understood to be far more difficult to raise the concentration of urea locally in the circulating fluid and tissues than was assumed before the days of modern detailed blood and tissue analysis, the possible harmfulness of urea itself in the body has lost some of its former probability. Accordingly, instead of grossly ascribing the apparent intoxication in so-called uremia to urea, a more critical attitude has arisen. It must be admitted today[2] that, in certain patients, toxic symptoms occur when the urea and the total incoagulable nitrogen of the blood are either not increased or are increased to such a small extent that the symptoms observed can hardly be attributed either to the urea or to an increase in the total incoagulable nitrogen of the blood. This appears to be particularly true of those cases of uremia in which generalized epileptiform convulsions dominate the symptomatology. In such cases particularly, the search for a specific toxic substance seems indicated, and N. B. Foster[3] has reported the isolation of a toxic base from the blood of patients suffering from the convulsive form of uremia. As extremely large doses of urea seem, on the evidence of recorded investigations,[4] to be required to produce definite toxic effects in experimental animals, skepticism regarding the real toxicity of urea has further arisen.

For these reasons, as Hewlett and his collaborators remark,[2] the view has become generally accepted that the toxic effects of urea in any concentration encountered in patients are negligible, and that the symptoms of uremia are due to the action of the other and more poisonous substances. They have therefore undertaken the somewhat heroic and certainly disagreeable task of determining once again the possible toxic effects of urea by experiments in which men served as subjects. The investigations of the level of urea nitrogen in the blood in well defined cases of uremia of characteristic asthenic type show that urea concentration is usually not less than 100 mg. per hundred c.c. of blood, and that marked clinical symptoms almost invariably attend concentrations of 200 mg. As urea diffuses rapidly from the blood into the tissues, the quantities of urea taken by healthy persons by mouth must be very large in order to attain comparable con-

1. The Problem of Kidney Fatigue, editorial, THE JOURNAL A. M. A., Feb. 10, 1917, p. 464.

2. Hewlett, A. W.; Gilbert, Q. O., and Wickett, A. D.: The Toxic Effects of Urea on Normal Individuals, Arch. Int. Med., November, 1916, p. 637.

3. Foster, N. B.: The Isolation of a Toxic Substance from the Blood of Uremic Patients, Tr. Assn. Am. Phys., 30: 305, 1915.

4. Herter, C. A., and Wakeman, A. J.: On Alterations in the Composition of the Blood Resulting from Double Nephrectomy, Jour. Exper. Med., 4: 117, 1899. Marshall, E. K., Jr., and Davis, D. M.: Urea: Its Distribution in and Elimination from the Body, Jour. Biol. Chem., 18: 53, 1914.

centrations in the blood, particularly in view of the rapid elimination from the body by way of the kidneys in such normal subjects.

It was found that by giving approximately 100 gm. of urea by mouth over a short interval of time it is possible to increase the concentration of urea in the blood of normal persons to levels of from 160 to 245 mg. per hundred c.c. The investigators point out that such concentrations are comparable with those encountered in the asthenic type of uremia, and that if the symptoms in the latter condition are in any way dependent on the concentration of urea in the blood and tissues, symptoms should occur under the conditions of their experiment. They found, indeed, that at such levels of blood urea definite symptoms occur. These consist of headache, dizziness, apathy, drowsiness, bodily weakness and fatigue. These cerebral and bodily symptoms were most pronounced at the time of maximum concentration of urea in the blood.

It seems probable, therefore, in the words of the authors mentioned, that when as a result of nephritis the blood urea exceeds a concentration of 150 mg. per hundred c.c., the symptoms of bodily and mental asthenia may be explained in part as being due to the high concentration of urea in the body fluids and tissues. This by no means excludes the possibility that other substances may play a rôle in producing the symptoms of this type of uremia; indeed, the fact that animals die only when extraordinary doses of urea are administered suggests that the fatal outcome of asthenic uremia in man may be due to other substances than urea.

BRAZILIAN TRYPANOSOMIASIS—CHAGAS' DISEASE

When we speak of human trypanosomiasis, we think only of the sleeping disease of Africa. In Brazil, however, there occurs an entirely different form of human trypanosome disease, which was described in 1909 by Carlos Chagas.[1] It was in the course of an antimalarial campaign that certain observations were made which led to the discovery of this "new disease." Chagas noted that patients with fever, lymphatic and thyroid enlargements, and other symptoms, but without malarial organisms in the blood, lived in houses which harbored an insect which sucks human blood. Studying this insect more closely, he found that it contained trypanosomes, and by letting it bite monkeys and other vertebrates he could produce a form of trypanosomiasis. In the next place, he found that the blood of infants in the region contained the same trypanosome, and by injecting guinea-pigs with such blood he could produce trypanosomiasis in them. As one of the chief characteristics of the trypanosome thus discovered is sporulation without fertilization—schizogenesis—it accordingly was named *Schizotrypanum cruzi*. The insect in question is known as *Conorhinus megistus*. The cone-nose beetle, another species of the same genus, is widely distributed in the United States, and in some localities it may infest beds and suck human blood.

The human disease caused by the *Schizotrypanum cruzi* is endemic in certain regions of Brazil, and occurs there in various forms. In infants it usually is an acute disease with fever and other general symptoms, enlargement of lymph nodes, of the spleen, the liver and the thyroid, with a kind of myxedematous condition of the skin, and trypanosomes in the blood. Death may occur with meningo-encephalitic phenomena. After from twenty to thirty days of acute symptoms, the fever may fall, the parasites in the blood diminish in number, and the attack pass into a chronic phase. In older persons the disease usually is chronic; progressive enlargement of the thyroid is a marked feature, and there may be cutaneous pigmentation, muscular weakness, irregular heart action, and even cerebral diplegia. While symptoms of hypothyroidism may be quite distinct, typical cretinism with idiocy does not appear to occur in such marked form as in European regions of endemic goiter.[2] The evolution of the trypanosome in the insect host has been traced quite fully,[3] and there seems to be no doubt that in nature the bite of the conorhinus and possibly other insects is the regular mode of transmission of the disease, which, however, may be congenital. In man and other vertebrates the trypanosome first lives in the blood, whence it passes into the tissues, practically no organ being spared, the flagella and undulating membrane being lost, and a rounded form not unlike that of the leishmania assumed. Intercellular and intracellular agglomerations of small rounded bodies are found which, when liberated, may assume the typical trypanosome form. The skeletal muscles seem to be the seat of choice, then the adipose and connective tissue, the heart muscle, lymph nodes, etc. The parasite may multiply in muscle tissue without causing a definite reaction. In man the serous membranes, especially the peritoneum and pericardium, have been found greatly increased in thickness, and the lymph nodes, liver, spleen and heart enlarged. There may be marked parasitic and cellular infiltration; and other changes in the heart muscle and in the brain, especially in the acute form, may be multiple parasitic foci with invasion of the neurocytes. The thyroid is enlarged regularly, with infiltrations and fibrous

1. Nouvelle trypanosomiase humaine, Mem. do Inst. Oswaldo Cruz, 1909, **1**, 159; Nouvelle entité morbide de l'homme, ibid., 1911, **3**, 219.

2. Novaes: La trypanosomiase et son rapport avec le corps thyroide Rev. méd. de la Suisse romande, 1916, **36**, 592.

3. Rocha-Lima: Ueber das Verhalten des Erregers der brasilianischen Trypanosomiasis des Menschen in den Geweben, Verhandl. d. deutsch. path. Gesellsch., 1912, p. 454; Zum Verhalten von Schizotrypanum Cruzi in Warmblutern und Arthropoden, Arch. f. Schiffs- und Tropen Hyg., 1914, **16**, Suppl. 5. Brumpt: Le trypanosoma cruzi évolué chez le Conorhinus megistus, le Cimex lectularius, le C. Boneti et l'Ornithodorus moubata, Bull. Soc. de path. exot., 1912, **5**, 360; Pénétration du Schizotrypanum cruzi à travers la muqueuse oculaire saine, ibid., 1912, **5**, 723. Naegler: Experimentelle Studien über die Passage von Schizotrypanum cruzi durch einheimische Tiere, Zentralbl. f. Bakteriol., 1913, orig., **71**, 202.

changes, and, as stated, the effects of disturbed thyroid function are seen in the clinical picture.

Whether morbid conditions associated with goiter, occurring in other parts of the world, are of the same or similar nature as this interesting Brazilian disease we have yet to learn.

PHILOLOGY AND PATHOLOGY

Sometimes the man of letters who, in criticizing the follies of others, ventures out of his field, presents a spectacle quite as amusing as any which he satirizes. In a recent book, "On the Art of Writing," by Sir Arthur Quiller-Couch, occurs some animated comment on that useful, if hybrid, word "antibody." Sir Arthur's sprightly English is worth quoting:

> But I have another word for our men of science. It was inevitable, perhaps, that Latin—so long the universal language—should cease in time to be that in which scientific works were written. It was impossible, perhaps, to substitute, by consent, some equally neat and austere modern language, such as French. But when it became an accepted custom for each nation to use its own language in scientific treatises, it certainly was not foreseen that men of science would soon be making discoveries at a rate which left their skill in words outstripped; that having to invent their terms as they went along, yet being careless and contemptuous of a science in which they have no training, they would bombast out our dictionaries with monstrously invented words that not only would have made Quintilian stare and gasp, but would affront the decently literate of any age.
>
> After all, and though we must sigh and acquiesce in the building of Babel, we have some right to examine the bricks. I was waiting, the other day, in a doctor's anteroom, and picked up one of those books—it was a work on pathology—so thoughtfully left lying in such places; to persuade us, no doubt, to bear the ills we have rather than fly to others capable of being illustrated. I found myself engaged in following the antics of certain bacilli generically described as "antibodies." I do not accuse the author (who seemed to be a learned man) of having invented this abominable term; apparently it passed current among physiologists and he had accepted it for honest coin. I found it, later on, in Webster's invaluable dictionary; etymology, "body" (yours or mine), "anti," up against it; compound, "antibody," a noxious microbe.
>
> Now I do not doubt the creature thus named to be a poisonous little wretch. Those who know him may even agree that no word is too bad for him. But I am not thinking of *him*. I am thinking of *us;* and I say that for our own self-respect, whilst we retain any sense of intellectual pedigree, "antibody" is no word to throw even at a bacillus. The man who eats peas with his knife can at least claim a historical throwback to the days when forks had but two prongs and the spoons had been removed with the soup. But "antibody" has no such respectable derivation. It is, in fact, a barbarism, and a mongrel at that. The man who uses it debases the currency of learning; and I suggest to you that it is one of the many functions of a great University to maintain the standard of that currency, to guard the *jus et norma loquendi*, to protect us from such hasty fellows or, rather, to suppeditate them in their haste.

We have no wish to dwell on the novel conception of antibody here advanced for the delectation of pathologists, and shall only express the hope that some day Sir Arthur will push his researches a little farther than Webster's dictionary. It is impossible to refrain, however, from drawing attention to the implication presented by another mongrel word which pops out with delightful spontaneity in the easy flow of Sir Arthur's gentle diatribe. When he chanced on the debased and barbaric word "antibody" he was waiting, he says, "in a doctor's anteroom." Meticulous pedants may be pardoned for wondering why a "sense of intellectual pedigree" is not offended by the use of the word "anteroom," but is revolted by "antibody."

In point of fact, the novelty in a language has always to fight its way into good society. Once its position is made good it is accepted by writers of high and low degree, often, indeed, with touching unconcern, by the very persons who would preserve the "purity" of a language against newcomers of exactly similar lineage. Whatever be the case with respect to precise scientific nomenclature, which some believe stands on a different footing, there is no doubt that our ordinary language grows through additions based on usage and not according to strict rules of procedure. The hybrid may claim a right to live equally with the mutant.

Current Comment

THE FUNCTION OF THE PROSTATE

The student of medicine who searches for physiologic wisdom in regard to the functions of the prostate will be sorely disappointed. Structurally the prostate consists of glandular, connective and nonstriated muscular tissues. The latter are said to be arranged both longitudinally and circularly in relation to the glandular tissue; and the organ also is supplied with numerous nerve cells. Among the conjectures made in reference to this anatomically complex and therefore presumably physiologically active outfit has been the hypothesis that as a muscular structure the prostate possesses the properties of a sphincter for the bladder. This has been denied on the basis of available experimental evidence by G. Walker.[1] He believed that the prostatic musculature has as its prime function the discharge of the secretion prepared in the glandular portions. Marshall's[2] more recent review of the behavior of the prostate indicates that its musculature contracts during ejaculation, thus forcing its own secretions into the urethra and aiding in propelling the seminal fluid along this portion of the urogenital tract. The nature of the contractions, whether tonic or rhythmic, has not been indicated. J. A. Waddell[3] has contributed some facts regarding the innervation of the prostate and its consequent response to certain drugs. In the latter respect it resembles the vas

1. Beitrag zur Kenntnis der Anatomie und Physiologie der Prostata nebst Bemerkungen über die Vorgänge der Ejaculation, Arch. f. Anat., 1899, p. 313.
2. The Physiology of Reproduction, 1910, p. 258.
3. The Pharmacology of the Prostate, Jour. Pharmacol. and Exper. Therap., 1916, **9**, 179.

deferens[4] and the seminal vesicle.[5] Like other portions of the internal generative tract which have been examined, the prostate possesses a motor parasympathetic as well as a motor sympathetic innervation. The problem of the real function of the prostatic secretion itself is left unsolved. It has been noted that the spermatozoa are practically motionless while in the seminiferous tubules of the testis, but become actively motile in the vas deferens, or when mixed with prostatic secretion. This observation, however, is far from solving the questions at issue, especially since removal of the prostate and seminal vesicles in animals seems to prevent the possibility of fertilizing, although the testes remain apparently intact.[6]

SOME ASPECTS OF PLACENTAL FUNCTION

A century and a half have elapsed since John Hunter or his brother William Hunter—or, if it serve truth better, both of these—discovered the real nature of the connection between the mother and the fetus, thereby laying the foundation for our present knowledge of the structure of the placenta. There is no direct channel of communication between fetal and maternal circulation. The placenta represents the fetal organ for respiration, nutrition and excretion. As to the nature of the exchanges which go on between the two related organisms and the mechanisms involved in the transference, practically nothing is known. The structure of the parts concerned favors an interchange of products between the mother and the fetus. An extensive vascular bed, chiefly secured by division of the large fetal vessels into a myriad of smaller ones, is further enlarged by the arrangement of the smallest of these; they form loops which hang toward the maternal blood. The vascular loops surrounded by connective tissue, which, in turn, is covered by epithelium, constitute the chorionic villi. These tiny, finger-like projections are immersed in lakes of maternal blood. They act both as receptors of nutriment for the fetus and as its excretory agents. Beyond these facts, we are told by Slemons and Morriss,[7] from whom the foregoing description is borrowed, knowledge of the physiology of the villi is fragmentary. How substances pass from one circulation to the other through the layers of the chorionic connective tissue and epithelium—which, together with the wall of the fetal vessels, constitute the placental partition—is a question which is answered thus far only hypothetically. It has been assumed that the placenta takes some undefined sort of active participation in the preparation of the fetal nutriment. In this "vitalistic" conception, placental enzymes have recently been made to play a part, as is so often the case when physiologic obscurity necessitates so vague a hypothesis. The supporters of the "mechanistic" theory of placental function, on the other hand, believe that the placenta behaves essentially as a permeable membrane. Slemons and Morriss have studied the comparative chemical composition of fetal and maternal blood. As nearly as possible the specimens were obtained simultaneously, just after birth occurred. In a considerable number of normal obstetric patients the average rest-nitrogen was found to be 25 mg. per hundred c.c. in both maternal and fetal bloods; the urea-nitrogen was likewise essentially the same in the two circulating fluids. This identity of content, particularly in the case of urea, indicates conclusively that this substance passes through the placenta by diffusion. Complications accompanied by an increase of urea in the maternal blood—toxemias of pregnancy, syphilis, decompensated heart lesions, and others—were also attended with a corresponding increase in the fetal blood-urea. This novel finding in pathologic cases clearly confirms the diffusibility of urea through the placenta. Whether or not there is an equally ready transfer of all the other soluble blood constituents, commonly included under the term rest-nitrogen of the blood, needs to be ascertained for each of the individual substances concerned. A ready equalization on each side of the placental partition seems more than probable, however, in the light of these new blood analyses.

THE FATE OF TRYPSIN IN THE STOMACH

The proteolytic enzyme of the pancreatic secretion has long been regarded as exceedingly sensitive to acids. In the presence of even low concentrations of acids, the tryptic power seems to be permanently diminished or completely lost. Many believe that gastric juice is peculiarly destructive to the proteolytic pancreatic ferment by virtue of the action of pepsin on the enzyme. There is a practical aspect to this. On the one hand it concerns the possible survival of tryptic power when intestinal contents are regurgitated into the stomach, as occasionally happens. On the other hand, the futility of administering trypsin preparations by way of the mouth must be gaged in part by the fate of the enzyme in its contact with the gastric contents. Judging by experiments which Long and Hull[1] have conducted in vitro, it appears that the common proteolytic enzyme of the pancreas, isolated as trypsin, is capable of withstanding a rather long digestion in presence of hydrochloric acid and pepsin, provided sufficient protein of some form is present to combine with all or part of the acid and so bring the hydrogen-ion concentration down to a certain level. They[2] have now corroborated these findings by a study of what happens in the living stomach of animals under conditions which might well obtain in the human stomach at times when trypsin is ingested. Long and Hull report new experiments in which the secretion of pepsin and acid was abundant, and from this point of view the conditions for the persistence of trypsin were not favorable. Yet, in the larger number of experiments,

4. Waddell, J. A.: The Pharmacology of the Vas Deferens, Jour. Pharmacol. and Exper. Therap., 1916, **8**, 551.
5. Waddell, J. A.: The Pharmacology of the Seminal Vesicles, Jour. Pharmacol. and Exper. Therap., 1916, **9**, 113.
6. Steinach, E.: Untersuchungen zur vergleichenden Physiologie der männlichen Geschlechtsorgane, insbesondere der accessorischen Geschlechtsdrüsen, Arch. f. d. ges. Physiol., 1894, **56**, 304.
7. Slemons, J. M., and Morriss, W. H.: The Non-Protein Nitrogen and Urea in the Maternal and Fetal Blood at the Time of Birth, Bull. Johns Hopkins Hosp., 1916, **27**, 343.

1. Long, J. H., and Hull, Mary: On the Assumed Destruction of Trypsin by Pepsin and Acid, I, Jour. Am. Chem. Soc., 1916, **38**, 1620.
2. Long, J. H., and Hull, Mary: On the Assumed Destruction of Trypsin by Pepsin and Acid, II, Observations on Animals, Jour. Am. Chem. Soc., 1917, **39**, 162.

the latter ferment was not destroyed by the other combination when sufficient protein was present to bring the concentration of the free acid down to a certain value. Trypsin seemed to be destroyed or greatly weakened only when the acid was in excess with pepsin. From these observations it appears, further, that possibly some tryptic digestion may occur even within the stomach when the free acid is low from protein combinations; and the destruction or weakening of the trypsin is a function, probably, of the hydrogen-ion concentration. The trypsins employed in these experiments were relatively strong products. It is not to be concluded that these results even remotely suggest that the administration of a few grains of the various commercial products claimed to contain trypsin or pancreatin would have any therapeutic significance. In the dosages employed, such preparations are, as has been shown elsewhere, too weak to have any appreciable action.

FOOD SUPPLY AND GROWTH OF POPULATION

The bodily welfare of man is dependent in large degree on a satisfactory solution of the problems of food, clothing and shelter. With the rapid growth of population the need of suitable nutrients increases at a corresponding rate. Economic foresight accordingly leads the critical observer of the increasing number of persons who demand sustenance to inquire whether the sources of supply continue to be adequate and whether they are likely to keep pace with the demands of the expanding nation in the years to come. Prophecies of impending crises have been made from time to time by serious minded scientists and economists. One writer, basing his view on the contention that wheat is the most sustaining food grain of the Caucasian race, has ventured the belief that if prophecies based on population statistics are trustworthy, the crisis will be on us before the end of the century. It must be remembered, however, that the acreage devoted to agriculture is still expanding and that conservation processes as well as other factors, such as improved transportation facilities and changing customs in diet, are helping to improve the outlook. New food possibilities are frequently being brought within the range of present needs. In 1900 the population of the United States was 76 millions; now it is estimated at over 100 millions — a growth of 33 per cent. The latest report of the secretary of agriculture gives some indication of the extent to which the supply of a variety of food products has kept pace with the growing demand occasioned by this increment of population. The total production of most items on the food supply lists, such as poultry, fish, cereals, potatoes, citrus fruits and orchard fruits, during the sixteen years in which 26 millions of persons were added to the numbers to be fed, shows no diminution per capita. The sugar production is the only one showing a significant increase. Meat and dairy products constitute 37 per cent. of the average diet, fish 2 per cent., cereals 31 per cent., Irish and sweet potatoes 13 per cent., and other vegetables 8 per cent. It is notable that, notwithstanding the rapid increase in population, the production per capita of the commodities indicated, with the exception of meats and dairy products, has remained approximately the same or has increased.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Tuberculosis Foes Meet.—A joint conference of the San Francisco and California Associations for the Study and Prevention of Tuberculosis was held at the St. Francis' Hotel, San Francisco, January 25. The following physicians were reelected members of the board of directors: Drs. Mariana Bertola, Walter B. Coffey, Attilio H. Giannini, Charles G. Levison, Harry M. Sherman and William C. Voorsanger, all of San Francisco.

Intern Examination.—The Civil Service Commission of the County of Los Angeles announces an open competitive examination for intern in the Los Angeles County Hospital, to be held, March 2, at various places throughout the country. Applicants must be at least 21 years of age, citizens of the United States and must make application on blank forms, which will be sent on request, to the Los Angeles County Civil Service Commission. There are eighteen positions to be filled in July, 1917, and ten in January, 1918. The service is for eighteen months, and the compensation includes full maintenance and uniform. All successful candidates must be graduates of medical institutions of recognized standing.

ILLINOIS

Tuberculosis Hospital for Springfield.—St. John's Hospital, Springfield, will build a tuberculosis sanatorium to cost $500,000. It will be 6 miles east of Springfield on a site of 153 acres. Work will be begun in March.

Smallpox in Mining Camps.—Over 100 cases of smallpox have been reported in mining camps at Tovy, Bulpitt, Kincaid and Jerseyville. The situation is in charge of Dr. Edwin B. Godfrey, state board of health epidemiologist.

Library for Society.—Sangamon County Medical Society has established a medical library in the lecture room of St. John's Hospital, Springfield. A number of medical books and magazines have been donated, and it is hoped to open the library in March.

Chicago

Personal.—Dr. Jacob J. Minke returned to Chicago, February 8, after eight months' service in a military hospital at Pardubitz, near Prague, Bohemia.

Dr. Billings Convalescent.—Dr. Frank Billings, who has been ill with pneumonia at his home, has safely passed the crisis and is steadily improving.

Women's Clinics.—The Women's Medical Club of Chicago held clinics for women physicians of Illinois, February 12 to 16. February 14 a banquet was held at the college club rooms. Clinics were held at various hospitals during the week.

Scarlet Fever at University.—February 8, two additional cases of scarlet fever were reported in the Delta Upsilon fraternity house at the University of Chicago. Thirteen members of the fraternity were placed under quarantine and part of Hitchcock Hall was also quarantined.

New Red Cross Unit.—A new Red Cross unit was formed at St. Luke's Hospital, February 10, with Mrs. Heaton Owsley as chairman. The organization will be divided into two classes under the direction of Dr. Lewis L. McArthur, and will meet at St. Luke's and Michael Reese hospitals.

INDIANA

Fire at Hospital.—Fire at West Baden, February 11, destroyed the hospital at the West Baden Hotel, with a loss of about $25,000. No lives were lost.

County Hospital Opened.—The Bartholomew County Hospital, Columbus, built at a cost of $100,000, was opened,

February 6. This is the first hospital to be built in the state under the law giving counties the right to erect public county hospitals on petition of the requisite number of tax payers.

Personal.—Dr. J. Rilus Eastman, Indianapolis, who has been chief surgeon in charge of a hospital in Vienna for several months, will return about February 20. Dr. Henry O. Bruggemann, Fort Wayne, who had expected to sail for Rotterdam, February 5, to take Dr. Eastman's place, has given up the trip on account of the severance of diplomatic relations between the United States and Germany.——Dr. Robert C. Johnson, Frankfort, has been appointed first lieutenant, M. C., Ind. N. G., and assigned to Ambulance Company No. 1, succeeding Dr. Donald C. McClelland, Lafayette, resigned.——Drs. Julius E. Hiatt, Edson K. Westhafer and George H. Smith, Newcastle, suffered a loss of their offices, furniture and fixtures by fire, February 6.——At the annual meeting of the Indiana Society for the Prevention of Tuberculosis held in South Bend, Dr. Alfred Henry, Indianapolis, was elected president and Dr. Roscoe L. Sensenich, South Bend, vice president.

MARYLAND

Hospitals Offered to Government.—The Eudowood Sanitarium at Towson and the General and Marine Hospital at Crisfield have been offered to the government in case of war.

Personal.—Dr. Ernest H. Gaither and Dr. Dwight H. Mohr, Baltimore, have been appointed on the staff of the Franklin Square Hospital.——Dr. Howard A. Kelly, Baltimore, who has been ill with pneumonia in Florida, is recovering and will return to Baltimore within a few weeks.

Infant Mortality.—The Baby Welfare Association has issued a report showing the relative standing of the ten largest cities in the country with regard to the infant mortality rate. The ten cities and the order in which they stand are St. Louis, New York, Philadelphia, Boston, Cleveland, Pittsburgh, Chicago, Detroit, Buffalo and Baltimore, the rate ranging per thousand from eighty-nine in St. Louis to 118 in Baltimore. While Baltimore stands tenth in actual infant mortality rate, the city has made the largest reduction in the infantile death rate of any of the ten cities.

NEW JERSEY

Site for Hospital Offered.—Edward Seifert has offered 28 acres on the New Homestead Road to the Rockland County Tuberculosis Hospital.

Smallpox at Railway Camp.—Following a case of smallpox in a camp of the Erie Railway, at Jersey City, 300 workmen, mostly Mexicans and negroes, were vaccinated, January 28.

War on Mosquitoes.—The New Jersey Mosquito Extermination Association has asked the legislature for $100,000 for the current year to pay for work done by the municipal authorities and salt marsh counties to rid the state of mosquitoes. According to the New Jersey state entomologist, nearly 200,000 acres of marsh in Ocean, Burlington, Atlantic and Cape May counties remain to be drained.

Personal.—Dr. Jacob C. Price, director of the state department of health, gave a luncheon in Trenton, January 11, to the chiefs of various departments, in honor of Dr. Millard Knowlton, who has been in charge of the bureau of education and publicity since its beginning, and who has resigned to take up the study of public health at Harvard University.——Capt. Frank Y. Xeer, Paterson, assigned to Fifth Infantry, has been promoted to major, succeeding Major Joseph V. Bergin, resigned.——Lieutenant Craig, Ridgewood, has been promoted to captain.

NEW YORK

New Laboratory Site.—The state department of health has purchased a site for a new laboratory at Albany, at a cost of $40,000.

State Society to Come to Utica.—The Medical Society of the State of New York will meet at Utica, April 23 to 26. Headquarters will be at the state armory.

Ambulance Company Officers Entertained.—The officers of the Second Ambulance Company, which returned from the border a short time ago, were entertained at dinner by the officers of the Rochester Base Hospital, at the rooms of the Rochester Physicians' Association. Dr. John M. Swan presided.

Hospital Wanted for Westchester.—Three hundred thousand dollars has been appropriated for a hospital at East View. The present county hospital has accommodation for 110 patients, and during the last year there were at least 135 patients who needed hospital treatment. The new hospital will cost $1,200,000, and will accommodate 600 patients.

Reduction of Infant Mortality.—In spite of a recent epidemic of infantile paralysis, the infant mortality rate for the state, outside of New York City, for 1916 was ninety-four per thousand, a reduction of six points from 1915 and of twenty points from 1911. There was also an actual reduction of 481 deaths of infants during the year. The death rates from scarlet fever, typhoid fever, diphtheria and tuberculosis were the lowest in the history of the state.

Personal.—Dr. Raymond Sanderson has resigned as director of the Ulster County Laboratory, Kingston, to accept the position of pathologist at Vassar Hospital, Poughkeepsie.——Dr. Franklin N. Barrows has been appointed assistant health commissioner of Buffalo.——Dr. James Taylor Harrington has been appointed commissioner of health of Poughkeepsie, succeeding Dr. Lewis H. Marks, resigned.——Dr. John H. Pryor has been elected president of the Buffalo Association for the Relief and Control of Tuberculosis.

Compensation Cost.—The State Industrial Commission states that the aggregate amount of compensation paid in New York state under the workmen's compensation law during 1916 was $11,500,000, which includes $5,000,000 for deaths, nearly $4,500,000 for permanent injuries and nearly $2,000,000 for temporary injuries. This does not represent the total economic loss from accident and it does not include the cost of medical benefits, the administration of the compensation law, or the wages and medical loss of injured employees not covered by the compensation. This would probably make the direct and indirect loss of the year amount to nearly $30,000,000.

New York City

Harvey Society Lecture.—The next of the series of Harvey Society Lectures will be given at the New York Academy of Medicine, February 24. Prof. John R. Murlin of Cornell University will lecture on "The Metabolism of Mother and Offspring Before and After Parturition."

Three Ambulances for City.—The Militia of Mercy has presented to the city three ambulances, used since last September for transporting infantile paralysis victims from their homes to hospitals for after-treatment. These ambulances cost $4,500 each, and have transported 5,000 patients since last September.

New Tuberculosis Procedure.—At a conference with Chief Justice McAdoo on the control of unruly consumptives, Judge McAdoo suggests that unruly consumptives be brought before him for possible commitment to the custody of the department of corrections for disorderly conduct. Hereafter this method will be adopted.

Nasal Diphtheria Prevalent.—An unusual number of cases of nasal diphtheria have been brought to the attention of the department of health by the physicians of Willard Parker Hospital. The disease runs a mild course and resembles an ordinary rhinitis. Physicians are urged to be on the lookout and to send cultures of rhinitis in infants to the department laboratory for diagnosis.

Conference on Hospital Social Service.—The seventeenth meeting of the New York Conference on Hospital Social Service was held at the New York Academy of Medicine, February 7. The topic of the evening was "Children." Papers were presented by Dr. Henry D. Chapin on "Preventive Care of Children"; by Dr. Charles R. Conklin on "Preventive Work for Chorea," and by Dr. Frederick L. Brush on "Home Convalescence."

Increased Death Rate.—During the week ending February 3, there were 200 deaths more than in the corresponding week of 1916. Of the 1,754 persons who died in the city, 239 deaths were from lobar pneumonia, 121 from bronchial pneumonia, forty from influenza and twenty-one from bronchitis, a total of 421 deaths from respiratory diseases. The death rate for the week was 15.95 per thousand, which compares unfavorably with 14.41, the rate for the corresponding week of 1916.

Examination for Oculist.—The Municipal Civil Service Commission will receive at the Municipal Building up to February 23, applications for the position of oculist, grade two. Applicants must be between 21 and 45 years of age, and must present a license to practice medicine in the state of New York, and evidence of at least one year of internship or three years' service in the outpatient department of a hospital giving special training in diseases of the eye. Duties are supervision and responsibility for the diagnosis and treat-

ment of diseases, physical abnormalities and other conditions of the eyes in the City Hospital Clinic or other institutions. Compensation varies from $1,030 to $1,380 a year. Oculists are usually required to work twenty-one hours a week in the department of health.

OKLAHOMA

Personal.—Dr. Benjamin S. Gardner, Marietta, fell from a porch at his home recently, dislocating his hip.——Dr. Joseph W. Bone, Sapulpa, who has been ill for several months, is reported convalescent.

OREGON

Date Fixed for State Meeting.—The next annual meeting of the Oregon State Medical Association will be held in Portland, June 28 to 30.

State Board Asks Larger Staff.—The state board of health in its report asks for a school nurse for the inspection of schoolchildren and the supervision of school sanitation; an epidemiologist as deputy health officer, and a field representative for public educational work.

Personal.—Dr. Harry F. McCay, Portland, has been appointed county physician of Multnomah County, to succeed Dr. E. P. Geary.——Dr. Spiro Sargentich, Portland, was the guest at a dinner given by fifty physicians of the city recently, at which he detailed some of his experiences as a surgeon in the Serbian army.

PENNSYLVANIA

To Disinfect School Pencils.—A bill introduced into the senate, February 7, provides for the daily disinfection of all pencils and penholders used by the school pupils.

Typhoid Fever.—Dr. Howard Hull of the state department of health, Harrisburg, is investigating the typhoid epidemic in Rush Township, Center County, where he found eighty-eight cases instead of the thirty-five originally reported by the health board. It is planned to open a temporary hospital at Osceola Mills, in the infected territory.

Economic Topics Discussed.—The Lehigh Valley Medical Association met in Palmerton, February 1. Dr. John W. Luther, chief surgeon of the New Jersey Zinc Company, Palmerton, spoke on "The Physical Examination of Employees"; Major Robert U. Patterson, M. C., U. S. Army, director of the Bureau Service of the American Red Cross, on "The Relation of the Red Cross to Civilian Physicians and the Military Service," and Dr. Francis D. Patterson, Harrisburg, chief of the Division of Industrial Hygiene and Engineering of the Department of Labor and Industry, on "The Relation of the Physician to Some of the Problems of Modern Industry."

Personal.—Dr. Henry A. Gorman, first assistant physician at Mont Alto Sanatorium for five years, was elected senior resident physician of the Harrisburg Hospital, January 29. ——The residence and office of Dr. Willet E. Hughes, Ashley, were damaged by fire to the extent of $4,500, January 30.——Dr. William C. White, medical director of the Tuberculosis League Hospital, Pittsburgh, has accepted an invitation to go to France and assist in restoring the health of French soldiers who have returned from the front suffering from pulmonary tuberculosis.——Dr. Robert M. Patterson, Beaver Falls, is recovering from an operation for appendicitis.——Dr. Robert H. Jeffrey, Uledi, has been appointed director of the safety department of the W. J. Rainey Company, Uniontown, to succeed Dr. Samuel A. Baltz, resigned.

Philadelphia

Memorial to White.—In memory of the late Dr. William White, his widow has presented a motor ambulance to the American Ambulance corps on the western war front.

New Field Hospital Established.—Dr. Eugene Swayne, at a meeting held January 18, organized a new field hospital company to be known as Field Hospital Company No. 3, N. G. Pa.

New Officers.—The newly elected officers of the Philadelphia Pediatric Society are: president, Dr. John F. Sinclair; vice president, Dr. William Duffield Robinson; secretary, Dr. A. Graeme Mitchell, and treasurer, Dr. Charles V. Dorwarth. ——Section of Ophthalmology of the College of Physicians: Dr. William T. Shoemaker, chairman, and Dr. J. Milton Griscom, clerk.

Alumni Day.—Alumni Day will be celebrated at the University of Pennsylvania, February 21, with a luncheon in Houston Hall; an alumni meeting at which information about the medical merger will be given, and a dinner by the provost to visiting alumni in the evening. February 22, the exercises of University Day will be held at the Academy of Music. The address will be delivered by President Jacob Gould Shurman of Cornell University.

Personal.—Dr. L. Webster Fox has been reelected president of the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind.——Dr. Francis Abbott has returned to the war zone in France.——Dr. Hugh B. O'Donnell was injured, January 19, in a collision between his automobile and a trolley car.——Dr. Horace Phillips has been appointed visiting physician in the psychopathic ward of the Philadelphia Hospital, succeeding Dr. Albert C. Buckley, resigned.——Dr. David N. Husik has been appointed laryngologist and otologist to the Philadelphia General Hospital, succeeding Dr. Charles P. Grayson, resigned.

CANADA

Personals.—Col. Herbert A. Bruce, Toronto, was tendered a complimentary banquet by many medical friends in Toronto, February 14.——Capt. Robert J. Wilson, Toronto, is home from the Ontario Military Hospital, England, having come out as medical officer with a party of wounded soldiers.——Col. John Taylor Fotheringham, Toronto, has been made a C. M. G.

University News.—At the McGill annual class dinner it was announced that 1,800 graduates of McGill were serving abroad; that 132 had been killed and 163 wounded. One of the fellows of the medical faculty has received the V. C., four the D. S. O., one the C. M. G., one the Order of the Bath and seven have been mentioned in dispatches. The forty-three graduates of the class of 1917 have volunteered in a body.

Insanity in Quebec Increasing.—The annual report of the Verdun Hospital for the Insane shows that at the close of 1916 there were 766 patients as inmates, an increase of forty over 1915. The 1916 figures comprise 382 men and 384 women. Twenty returned soldiers were admitted during the year, of whom thirteen were being treated at the close of the year. The total number of patients undergoing treatment throughout the year was 962, as against 911 in 1915. Dr. Burgess, the superintendent, stated that the principal causes of insanity were mental anxiety due to family afflictions, business worries, disappointments, etc. Drink and drugs came a poor second, while senility, heredity and vice filled up the rest of the list. During 1916, 131 patients had been discharged, and there were sixty-one deaths, general paresis leading as the cause of death.

GENERAL

Sioux Valley Medical Association Meeting.—The Sioux Valley Medical Association will hold its next annual meeting at Sioux Falls, S. D., in June.

Red Cross Base Hospital at Milwaukee.—The Milwaukee Chapter of the American Red Cross has raised $30,000 for a base hospital, of which Dr. John L. Yates will be in charge.

Indian Service News.—Dr. Joseph A. Murphy, medical supervisor, has resigned.——Dr. Robert W. Bell of the San Juan Reservation, N. M., has been placed on the active list, M. R. C., U. S. Army.

New Journal of Endocrinology.—The first issue of a quarterly to be known as *Endocrinology: The Bulletin of the Association for the Study of Internal Secretions* has just appeared. It is edited and published by the secretary at Glendale, Calif.

Railway Surgeons to Meet.—The tenth annual meeting of the Association of Surgeons of the Illinois Central and the Yazoo and Mississippi Valley Railroad companies will be held in New Orleans, March 30 and 31, with headquarters at the Hotel Grunewald.

McIntire Prize.—The American Academy of Medicine announces two prizes from the McIntyre fund, one to be awarded in 1918, and the other in 1921. The subject for 1918 is "The Principles Governing Physicians' Compensation in the Various Forms of Social Insurance." The committee to award this prize consists of Drs. John L. Heffron, Syracuse, N. Y.; Reuben Peterson, Ann Arbor, Mich., and John Staige Davis, Richmond, Va. The subject for 1921 is "What Effect Has Child Labor on the Growth of the Body?" The committee consists of Drs. Thomas S. Arbuthnot, Pittsburgh; Winfield Scott Hall, Chicago, and James C. Wilson, Philadelphia. The prize for 1918 will amount to $100, and in 1921

to $250. Detailed terms governing the competition may be secured from the secretary of the academy.

Bequests and Donations.—The following bequests and donations have recently been announced:

Presbyterian Hospital, Philadelphia, $5,000, to maintain a bed for the members of the Harriet Holland Memorial Church Sunday School, by the will of Ella B. Morris.

The John S. Billings Memorial Fund, for the purchasing of books for the New York Public Library, and the Anna Palmer Draper Fund, $450,000; Polyclinic Hospital, New York, $47,767; Children's Aid Society; New York Association for Improving the Condition of the Poor; New York Skin and Cancer Hospital, and Laboratory of Surgical Research of the New York University, each $23,883, by the will of Mrs. Mary Palmer Draper.

New York Association for Improving the Condition of the Poor, and New York Association for the Blind, each $10,000, by the will of Mrs. E. T. Lord.

Postgraduate Hospital, New York, $2,000, the proceeds of a sale and entertainment for the benefit of the Babies' Ward.

FOREIGN

Psychopathic Prize.—The late Dr. Valentin Magnan, formerly president of the Paris Academy of Medicine, has bequeathed to that organization the sum of $5,000, the income of which is to be awarded triennially to the author of the best work on a psychopathic subject.

Swiss Neurologic Journal.—The Swiss Neurologic Association at its recent annual meeting voted to found with the Alienist Association a journal to be the official organ of the two societies and publish their transactions and original articles.

From Cuba.—Dr. R. Menocal, professor of clinical surgery and skin diseases at the University of Havana, has been appointed secretary of the national public health service, better known as the "Sanidad y Beneficiencia." The profession in Cuba tendered him a banquet on the occasion. He takes the place left vacant by the death of Dr. Enrique Nuñez. Prof. F. Dominguez Roldan was appointed dean of the medical faculty in place of Menocal.

Deaths in the Profession Abroad.—E. Cervera, one of the leading surgeons in Spain, director of the Instituto Rubio since the death of Rubio, aged 61. He is said to have been the model of a good physician who was at the same time a most skilful operator. He founded a department at the institute for research on cancer, and published a number of works on abdominal and nerve surgery, and on the gastro-duodenohepatic associations of pancreatic disease.

Cooperation with International Health Board.—The president of the state of Rio de Janeiro, according to W. C. Downs, commercial attaché at Rio (*Commerce Reports*, February 8), has been given authority to facilitate the mission of the International Health Board by decreeing sanitary measures, taking the necessary steps to obtain the aid of municipal councils and meeting necessary expenses by opening the required credit. A decree covering these points will be submitted to the legislative assembly at its first regular meeting for definite approval.

Presentation of Bloch's Portrait.—An oil portrait of Prof. C. T. Bloch was hung recently with appropriate ceremonies in the hall of the Surgical Academy at Copenhagen, in preparation for his approaching seventieth birthday. The surplus left from the subscriptions for the portrait was presented to him, and he turned it over to the building fund of the medical society. He was for a long time on the editorial staff of the *Hospitalstidende* and has published numerous works in this and in Scandinavian, British and French surgical journals. He has also published several books, including one on the history of treatment of wounds from the earliest to modern times.

Association of Medical School Inspectors in the Netherlands.—Replies to a questionnaire sent out to the members of the Netherlands Vereeniging van Schoolartsen show that the advice of medical inspectors is seldom sought when a new schoolhouse is contemplated, and still more rarely is it heeded. In three new schoolbuildings the schoolrooms are on the north and the locker rooms take up the south exposure. In others the playgrounds are to the north of the building. At the recent annual meeting a number of speakers emphasized the importance of open-air schools in the fight against tuberculosis. They complete the cure for children who have taken a course of treatment in a sanatorium. The ferry boat open-air schools of New York were commended. The fact that some other member of the family has or has had tuberculosis should entitle a child to admission into the open-air school, but "open" and surgical tuberculous patients belong in institutions. The association, in connection with the association of language teachers, voted to found a special journal.

Inconsistencies of Recent French Legislation on Taxation of Pharmaceuticals.—G. Linossier comments in the *Paris médical* on a recent law imposing a tax on pharmaceutic specialties. A tax is imposed on pharmaceutic specialties of which the formula is not published and which an older law prohibited from being sold. Officials are in a quandary, as infractions of the old law have been overlooked to an extent impossible under the new law. Pharmacy inspectors find it difficult to forbid the sale of remedies on which the state has already collected a revenue tax. The restriction of the tax to pharmaceuticals with secret formulas hits French manufacturers in particular, as most French pharmaceuticals are merely combinations of known drugs put up in an attractive way under a fancy name. The owners do not like to publish the formulas, as any one could then make them up. German pharmaceuticals are mostly new synthetics, the composition of which is known and which are exempt under the new law. Linossier admits that the legislators had no intention of favoring German pharmaceuticals but blundered merely from ignorance, and asks whether or not it is the proper thing to entrust such matters to incompetents.

Foreign Exchanges in 1916.—The first week in February brought an unusually large batch of European medical journals. The mail included the December numbers, making the volumes for 1916 complete for those received during the year. With the exception of Germany, until last week weekly exchanges have arrived as regularly as in the years before the war. They have come unfailingly from England, France, Holland, Italy, Russia, the Scandinavian countries, Spain and Switzerland. The monthlies in some of the countries have taken two years to complete their 1915 volumes, but they are now complete and are starting on their 1917 volumes. The Swiss *Correspondenz-Blatt* announced that it had skipped the November and December issues on account of a labor strike. The issue of the Netherlands weekly for July 29 failed to arrive, and also No. 2 of the big quarterly issued by the Swedish Medical Association. With these exceptions the file is complete for twelve exchanges from France, with three others not quite complete yet; one complete each from the Netherlands, Finland, Russia and Spain; three from Italy; three from Japan; seven from the Scandinavian countries and two from Switzerland. A few other journals from various countries show several gaps. Besides the above, the four journals from the leading South American states have arrived with a regularity unknown until 1915. Only about half of the issues of the five big German weeklies were received during 1916. They have been published; abstracts from the missing numbers have appeared occasionally in the Holland and Scandinavian journals. The *Zentralblatts* stopped coming in November, 1915, and only one lone *Zentralblatt* arrived in 1916. The above includes merely the journals in foreign languages that it has been the custom to review regularly in the current literature department.

WAR NOTES

Praise for Wisconsin Surgeon.—A surgical unit sent to Austria last summer in charge of Dr. John R. McDill, Milwaukee, has received high praise for efficiency from Prof. von Eiselsberg, in charge of Austrian military hospitals.

American Surgeons Abroad.—Drs. Carl Edwin Allison, Somerville, Mass.; James V. Ricci, Providence, R. I.; Jerome F. Potts, Washington, D. C.; William M. Findley, New York; Frederick A. Simmons, Wakefield, Mass.; J. Franklin Harvey, Boston; Charles Curtis Allen, Topeka, Kan.; Leo Thomas Kewer, Waverley, Mass.; Charles F. Gormly, Providence, R. I.; William H. Mackay, Worcester, Mass.; Audley O. Sanders, Boston; Stanley Bridges, Worcester, Mass., and Guy Watt, Worcester, sailed from New York, February 10, for service in the British hospitals on the western front.

PARIS LETTER

Paris, Jan. 18, 1917.

The War

IMPROVEMENT IN THE ORGANIZATION OF THE MILITARY SURGICAL SERVICE

The undersecretary of state of the military health service has adopted various noteworthy measures of organizing the surgical service of the army. For instance, a consulting surgeon has been appointed for each army corps. Surgical squads

have been formed to assist at the base hospitals whenever there has been a great deal of work. Each of these squads consists of a surgeon and his usual aids, assistant surgeon, anesthetist and trained assistants. This combination accomplishes results far superior to those obtained heretofore by isolated surgeons who had to work with untrained help picked at random.

INTER-ALLY CONFERENCE FOR THE STUDY OF PROFESSIONAL REEDUCATION

As stated in a previous letter, this conference will be held in Paris, March 6, at the initiative of the Belgian government, supported by the French government. The program of this conference will be as follows: First section—Physical reeducation: (*a*) physiotherapy and medical gymnastics; (*b*) prosthetic apparatus; (*c*) professional work. Second Section—Professional reeducation: (*a*) aspect of professional life; (*b*) When shall professional reeducation begin? Of what shall it consist? (1) Intellectual and (2) manual departments; (*c*) mechanical aids: working arms, orthopedic appliances and special equipment for the use of invalids; (*d*) organization of schools: large general schools, small special schools, methods of teaching, utilization, existing institutions and facilities. Third Section—The placing and adaptation of invalids: (*a*) in agriculture and the minor industries and business; (*b*) in industry: war industries and others; (*c*) relation of the able-bodied and invalids in shops as to salaries and division of work, etc. Fourth Section—Economical and social interests of invalids: (*a*) obligatory reeducation; (*b*) reeducation after the war of men who were unable to take advantage of this service during the hostilities; (*c*) absolute invalids; (*d*) permanent protection of the mutilated and crippled; mutual societies, cooperative societies, official organizations and private institutions. Fifth Section—The blind, the deaf, etc.: (*a*) their reeducation; (*b*) their placing; (*c*) their economic and social interests.

VALUE OF NERVE SUTURE IN WAR SURGERY

Drs. Chiray and E. Roger reported to the Société médicale des hôpitaux de Paris on cases of nerve suture. They insist that in order to draw valuable conclusions it is necessary to classify the observations carefully and to base them only on cases of nerve suture after complete section. Chiray and Roger found that nerve suture is followed by negative results in 29 per cent. of the cases; sensory response to electric stimulation, without motor response, occurs in 48 per cent., and motor and sensory restoration occurs in 23 per cent. Return of sensation always precedes return of motion. Motion returns in the radial nerve after five months, in the ulnar after eight months, in the median after seven months, in the sciatic and popliteal after from two to five months. The radial, sciatic and external popliteal nerves seem to give the best results. Experience has shown that early operation is the most effective; nevertheless, operations performed at the fourth or the sixth month are often successful. Chiray and Roger emphasize the importance of total resection of all fibrous tissue, coaptation of the severed ends without tension and without bruising. The particular method of operation does not seem to have any decisive bearing on the result. End-to-end suture and nerve grafting give equally good results. Chiray and Roger are convinced of the importance of postoperative treatment, particularly the use of a prosthesis and of the local ionization of potassium iodid. Dr. Albert Frouin, who has done considerable research work on the suture of nerves after complete section, reported to the Société de biologie the results he obtained. He makes an immediate suture, using silk floss instead of catgut for suture material, and the finest needles obtainable so that he can suture the perineurium without injuring the axis cylinders. Seventeen animals operated on in this manner walked very well on the soles of their feet after fifteen days.

CULTURE OF MEDICINAL PLANTS

M. de Poumeyrol recently presented to the general syndicate of the French drug trade a report on the harvest and culture of medicinal plants in France. The war has caused a considerable decrease in importation of these products, which come almost exclusively from other countries, and it is necessary to take steps to remedy this state of affairs. Russia has created a special section in her agricultural department, and has distributed to farmers seeds amounting in value to 9,000,000 rubles. She has also appropriated premiums, and arranged for loans to those who will cultivate these plants. M. de Poumeyrol's report requests that tests be made in agricultural and rural schools; that a manual be placed in the hands of those who would like to engage in this culture; that the necessary advice be given to those who want to cultivate medicinal plants now growing in a wild state, and that measures be taken by transportation companies to modify the tariff on these articles, which is already too high.

POISONING BY EXHAUST GASES IN AUTOMOBILE AMBULANCES

Dr. Tanon called the attention of the Réunion médico-chirurgicale de la V-e Armée to the danger of heating auto ambulances from the exhaust pipe when the motor is not working right and the joints are not sealed hermetically. Fumes are discharged into the interior of the car. These fumes are noxious. In some cases they have caused fatal results. Although the quantity of carbon monoxid contained in the gases is small, the lesions observed at the necropsy are those of carbon monoxid poisoning. The products of incomplete combustion do not cause death in the animal. They do not destroy the red blood cells, nor do they reduce the hemoglobin. Blood impregnated with carbon monoxid is capable of reabsorbing oxygen, but greater activity of the respiratory apparatus and the respiratory center is required. The first symptoms experienced appear to be the result of a toxic action on the respiratory center. Physicians at base hospitals should instruct the chauffeurs as to the dangers of exhaust heating systems. Every conveyance heated in this manner should be inspected regularly and often, and repaired as soon as even a trace of gas is detected.

LONDON LETTER

LONDON, Jan. 22, 1917.

Sanaphos versus Sanatogen: a Comedy of Quackery

The vicissitudes of the German nostrum Sanatogen, since the beginning of the war, have been described in previous letters. They are not yet ended, and may be described as a comedy in three acts:

Act I. Taking advantage of the animosity against everything German, a British company starts a new nostrum under the name of Sanaphos, and, with the usual blatant boastfulness, proclaims it a soverign remedy and an improvement on Sanatogen.

Act II. The government sells the assets of Sanatogen to a British company (THE JOURNAL, Dec. 16, 1916, p. 1861) which announces that "the business will be conducted on those thorough scientific lines which have in the past given the Germans almost a monopoly in the production of skilful organic compounds." "Many physicians," it was also stated, "informed us that they were disappointed with the effects of the numerous imitations of Sanatogen."

Act. III. The wrath of the Sanaphos people has been aroused by this move, and they have sent to physicians the following circular letter as a rejoinder:

> In accordance with the strange policy adopted by our Government in connection with Enemy concerns, the German owner of Sanatogen has been allowed to capitalise his good will. [This is only another way of saying that the government has sold the good will, and the question what will be done with the proceeds remains for settlement after the war. The object, of course, is to make capital out of the anti-German feeling of the country.] Presumably the proceeds, and the accumulated profits collected for him by the State, will be held for his benefit at the end of the War. The new owners have in connection with their advertising scheme thought it right to attack their British competitors. We desire to make it clear that Sanaphos is not, and never was, an imitation of Sanatogen; but it is what it professed to be, viz.: an improvement on Sanatogen, as is proved by the following scientific statement. Considerable light has recently been thrown on the etiology of deficiency diseases and you will agree that nervous disorders come within this category. Healthy nutrition is the only restorative in such cases and that is why the nerve food Sanaphos is so remarkably successful. It does not supply mere constituents like casein and phosphorus compounds, but contains also the vitalising and activating entities vitamines and enzymes. In other words, it is not a moribund chemical combination of casein and phosphates, but provides in addition the quickening nourishing qualities characteristic of fresh uncooked milk due to undestroyed vital constituents. Sanaphos is therefore paramount in the treatment of deficiency diseases and its powerful restorative effects as a nerve food and general reparative is thus accounted for by well-established physiological facts. It is unique also in being soluble, presenting its constituents when mixed with water exactly in the same condition as milk, and is further reinforced with easily appropriated organic phosphorus compounds.

Investigation of Cerebrospinal Fever

In the first year of the war, outbreaks of cerebrospinal fever occurred among the newly enlisted young soldiers in several of the camps scattered throughout England. The director-general of the Army Medical Service at once arranged for an investigation of the disease by the Medical

Research Committee (a body appointed under the insurance act for the purpose of organizing medical researches). A central laboratory and thirty-seven district laboratories were equipped.

The report of the committee, which has just been published, is most important. It was found by agglutination tests that there were four different types of meningococci. From these a serum was prepared for the treatment of the disease. It was found that: 1. A case of cerebrospinal fever yields only a simple type of meningococcus from the cerebrospinal fluid, that is, a case is always strictly one type or another. 2. The type found in the nose is always the same as the type in the brain. 3. The germ is always present in the nose at the beginning of the attack; therefore every case of the disease is an instance of a "carrier" becoming a victim to his own carried infection. 4. Finally, "type breeds true" in every case; the types are not interchangeable. As soon as a case is diagnosed, serum is administered. Swabs are taken from the nose and from all contacts. The energy with which this is done is shown by the fact that in the case of an outbreak in a large garrison, a large section amounting to 10,000 men, the vast majority of whom had not been in contact with patients, were swabbed and 400 of these were isolated until they became free from organisms. The results of treatment indicate great improvement; thus out of thirty-three military cases treated in the London district alone last season by serum prepared under these methods, only three patients died, a result in marked contrast with the 40 to 60 per cent. mortality usually found before this serum was available.

The Suppression of Quacks

Lord Rhondda (president of the Local Government Board) received a deputation yesterday from a number of local authorities and medical bodies, who submitted their reasons for urging that unqualified practitioners should be prevented from undertaking the treatment of venereal diseases. The lord mayor of Birmingham expressed the opinion that public money should not be spent unless the best results could be obtained, and that the work should not be minimized by unqualified persons being allowed to treat venereal cases. These diseases, to be perfectly treated, should be taken in hand in the early stages, and in order to protect the work of the local authorities quack advertisements should be suppressed, and unqualified persons prevented from treating the patients. Dr. Frederick Taylor, president of the College of Physicians, said that theoretically all diseases should be treated by those who knew how to deal with them and for that reason the Royal College of Physicians asked that unqualified persons should be stopped.

Lord Rhondda, in reply to the members of the deputation, said that his department fully realized the burning nature of the great question. We had to consider not only the health of the present population, but also the health of future generations, and the need of bringing up a healthy race. Of all the matters which came before him he looked on this as one of the most urgent and important questions which his department had to deal with in the near future. Having taken that view and having put their hands to the plow, there would be no turning back. He thought he could give them that assurance. He wished to thank the Royal Commission on Venereal Diseases for the work it had done. He thought it was largely due to the commission that the country today was so impressed with the urgency of the matter. They would not expect him to commit the government definitely that day to any particular form of legislation, but he thought he could give them the assurance that legislation would be required, and that it would probably be brought in. He was perfectly satisfied that physicians were actuated by considerations of state policy and not self-interest.

Restriction of the Production of Alcoholic Drinks

The government has issued an order reducing the quantity of beer to be brewed from April 1 to 70 per cent. of the output of the preceding year. This means a reduction to one half of that of the year preceding the war. There is to be a corresponding restriction in the release of wine and spirits in bond.

The food controller, Lord Devonport, states that these steps are in no way to be deemed measures of temperance or social reform. The barley, sugar and other ingredients used in brewing are required for food. It is a question of bread versus beer. In the year preceding the war, ending March 31, 1914, the quantity of beer brewed amounted to 36,000,000 standard barrels. The production of beer will be restricted by the new order to 18,200,000 standard barrels. The food side of the reduction is represented by 286,000 tons of barley, 36,000 tons of sugar and 16,500 tons of grits, also a brewing ingredient. On the transport side there will be, first of all, a large saving in mercantile marine tonnage; and further, a considerable saving in land transport, such as railway and other forms of haulage. There will also be a consequent reduction in the amount of labor employed and fuel consumed in the process of manufacturing beer. This restriction of brewing will further have a direct favorable effect on the production of meat and milk, because it will set free for the use of agriculturists—the class which produces meat and milk—a greater percentage of offals (the residuum of the barley used in brewing) than at present produced from brewers' grains. At present the brewer returns 25 per cent. of the barley he uses in the shape of feeding offals. But the barley, when milled—as it is intended to be by this order—gives, in the first place, 50 per cent. of flour, which is, of course, direct human food, and, of the remainder, 40 per cent. is returned in the shape of what is termed millers' offals. The liquor interest has asserted both by advertisement and by misinformed press statements that any restriction of brewing would have the injurious direct effect on feeding stuffs used by agriculturists. As a matter of fact, under these restrictions, the contrary will be the case.

Association News

THE NEW YORK SESSION

Scientific Exhibit

The Scientific Exhibit as the New York Session will occupy the Belvedere on the ninth floor of the Hotel Astor. The Belvedere is the summer roof-garden restaurant of the hotel. It is a beautiful hall with a glass roof and sides, and occupies the entire width of the building. Probably never before has the Scientific Exhibit been so luxuriously housed. Applications for space and a plat of the Exhibit Hall will be sent on request to individuals or institutions desiring to make exhibits. Applications should be made as early as possible. Final assignment of space will be made Monday, April 2, 1917, and all applications for space must be received before that time. The exhibit will open at noon, Monday, June 4, and will remain open until noon, Friday, June 8. The Scientific Exhibit has come to be regarded as one of the features of the Annual Session, and the exhibit at New York promises to be one of the best ever held. Application blanks and further details can be secured from Dr. Frederick R. Green, Director Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

List of New York Hotels Recommended by the Local Committee on Arrangements

The local Committee on Arrangements, on recommendation of its subcommittee on hotels, urges those who plan to attend the coming annual session in New York, June 4 to 8, to address the management of the hotel of their selection to make reservation directly with the hotel. Those who plan to attend the New York session should make their selection and write directly to the hotel, stating the accommodations desired and indicating the rate they are prepared to pay. The management of the hotel should be advised of the day on which guests expect to arrive in New York, and the length of time they plan to remain. The local committee assures those who write for accommodations that they will receive a prompt response from these hotels. If, in any instance, a satisfactory arrangement with some one of the listed hotels is not made, write to the chairman of the subcommittee on hotels, Dr. Reginald H. Sayre, 17 West Forty-Third Street, New York.

The accompanying table lists a number of New York hotels indicating the accommodations which are offered and naming the rates per day. All rates are for accommodations on the European plan except when, as indicated, the American plan is also offered.

TABLE OF DAILY RATES AND ACCOMMODATIONS OFFERED BY NEW YORK HOTELS

Hotels, Number of Rooms and Street Addresses	Rooms without Bath		Rooms with Bath		Parlor, Bedroom and Bath or Connecting Rooms for One or More Persons*
	For One Person	For Two Persons	For One Person	For Two Persons	
ASTOR—1,000—Times Square General Headquarters; also headquarters of the Sections on Ophthalmology, on Laryngology, Otology and Rhinology and on Stomatology.	$..... $.....	$..... $.....	$ 4.00 to $ 6.00	$ 5.00 to $ 8.00	$ 9.00 to $12.00
BILTMORE—1,000—Madison Ave. and 43d Headquarters of the Sections on Practice of Medicine, and Preventive Medicine and Public Health	....	....	4.00 to 5.00	6.00 to 7.00	....
MANHATTAN—700—Madison Ave. and 42d Headquarters of the Sections on Pharmacology and Therapeutics and on Dermatology.	2.50	....	3.50 to 4.00	5.00	....
McALPIN—1,600—Broadway and 34th Headquarters of the Sections on Diseases of Children, on Nervous and Mental Diseases, on Pathology and Physiology and on Gastro-Enterology and Proctology.	2.50 to 3.00	3.50 to 4.00	3.00 to 4.00	4.00 to 5.00	6.00 to 8.00
WALDORF-ASTORIA—1,200—Fifth Ave. and 34th Headquarters of the Sections on Surgery, General and Abdominal; on Obstetrics, Gynecology and Abdominal Surgery; on Genito-Urinary Diseases and on Orthopedic Surgery.	3.00	4.00	4.00	6.00	14.00 .....
ALBEMARLE—525—Broadway and 54th	....	....	2.00	3.00	4.00 .....
ALGONQUIN—250—59 W. 44th	....	....	2.50	3.50	5.00 to 6.00
ANSONIA—1,600—Broadway and 73d	2.00	3.00	2.50	5.00	6.00 to 10.00
ARLINGTON—175—18 W. 25th:					
European	1.50	2.50	2.00	3.00	3.00 to 4.00
American	3.00	5.50	3.50	6.00	4.50 to 7.00
BELLECLAIRE—320—Broadway at 77th	....	....	2.50	3.50	5.00 to 6.00
BELMONT—700—Park Ave. and 42d	2.50 to 3.50	3.50 to 4.50	3.50 to 8.00	4.50 to 9.00	....
BERKLEY—300—170 W. 74th	....	....	3.00	5.00	....
BLACKSTONE—300—50 E. 58th	....	....	2.50	4.00	5.00 to 6.00
BRESLIN—500—Broadway and 29th	2.00 to 3.00	4.00 to 5.00	2.50 to 4.00	5.00 to 8.00	....
BRISTOL—180—122 W. 49th:					
European	1.50	2.00	2.00	3.00	4.00 to 6.00
American	3.00	5.00	3.50	6.00	7.00 to 12.00
BROZTELL—250—Fifth Ave. and 27th	....	....	1.50	2.50	....
BUCKINGHAM—260—5th Ave. and 50th	1.50	2.50	2.50	3.50	....
CALUMET—140—340 W. 57th	....	....	1.50	2.50	....
CLARIDGES—250—Broadway and 44th	2.50	3.50	3.00 to 6.00	4.00 to 8.00	8.00 .....
CLENDENING—230—202 W. 103d	....	....	1.50 to 3.00	2.00 to 3.00	....
COLLINGWOOD—250—45 W. 35th	1.50	2.00	2.50	3.00 to 3.50	5.00 to 7.50
COLONIAL—300—81st St. and Manhattan Sq	1.50	....	2.00	....	....
CONTINENTAL—300—Broadway and 41st	....	....	2.00 to 3.00	3.00 to 4.00	....
CUMBERLAND—250—Broadway at 54th	1.50 to 2.00	2.50 to 3.00	2.00 to 2.50	3.00 to 3.50	4.00 to 5.00
EARLE—150—103 Waverly Pl.:					
European	....	....	2.00	3.00	4.00 to 5.00
American	....	....	3.50	5.00	6.00 to 7.00
ENDICOTT—600—Columbus Ave. and 81st	1.00 to 1.50	2.00 to 2.50	1.50 to 3.50	250 to 5.00	....
FLANDERS—300—135 W. 47th	....	....	1.50 to 2.50	2.50 to 3.00	3.50 to 4.00
FOURTEEN EAST 60TH—350	....	....	3.00 to 4.00	3.00 to 4.00	8.00 .....
GOTHAM—400—Fifth Ave. and 55th	....	....	4.00 to 5.00	5.00 to 8.00	....
GREAT NORTHERN—400—118 W. 57th	....	....	2.50 to 3.00	3.50 to 4.00	5.00 to 7.00
HERALD SQUARE—310—114 W. 34th	1.50	....	2.00	....	5.00 .....
HERMITAGE—250—Seventh Ave. and 42d	1.50 to 2.00	2.50 to 3.00	2.00 to 3.00	3.50 to 5.00	....
HOLLAND HOUSE—350—5th Ave. and 30th	....	....	3.00	4.00	5.00 to 8.00
HOLLEY—200—Washington Sq. W.:					
European	....	....	1.50	2.50	....
American	....	....	3.00	5.00	....
IMPERIAL—800—Broadway and 32d	2.00	3.00	2.50 to 3.00	4.00	5.00 .....
JUDSON—200—53 Washington Sq.:					
European	1.00	2.00	1.50	2.50	....
American	2.50	5.00	3.00	6.00	....
KNICKERBOCKER—600—Broadway and 42d	2.50	4.00	3.50	5.00 to 8.00	....
LAURELTON—150—145 W. 55th	....	....	2.00	3.00	....
LE MARQUIS—170—12 E. 31st:					
European	1.50	2.00	2.00	3.00	....
American	3.00	5.00 ...	3.50	6.50	....
LENOX—225—Madison Ave. and 63d	1.50	....	....	3.00	5.00 to 10.00
LUCERNE—300—201 W. 79th	....	....	1.50	2.00	....
MADISON SQUARE—200—37 Madison Sq	....	....	2.00	3.00 to 3.50	4.00 to 8.00
MAJESTIC—700—W. 72d at Central Park	2.00	3.00	2.50	4.00	6.00 to 8.00
MANHATTAN SQUARE—300—50 W. 77th	....	....	2.50	3.00	3.50 to 10.00
MARGARET—200—97 Columbia Heights, Brooklyn	1.00	....	2.00	....	3.00 .....
MARIE ANTOINETTE—500—Broadway and 66th	2.00	4.00	3.00	5.00	8.00 .....
MARLTON—150—3 W. 8th	1.00 to 2.00	2.00 to 3.00	2.00 to 3.00	3.00 to 4.00	....
MARTHA WASHINGTON—425—29 E. 29th (women only)	1.50	2.50	3.00	4.00	....
MARTINIQUE—625—Broadway and 32d	2.00	3.00	2.50	3.50	6.00 .....
MURRAY HILL—600—Park Ave. and 40th	2.00	3.00	3.00	4.00	5.50 to 7.50
NASSAU—500—Long Beach	....	....	4.00 to 5.00	5.00 to 8.00	....
NETHERLAND—400—Fifth Ave. and 59th	1.50 to 2.00	....	2.00 to 4.00	3.50 to 5.00	....
NEW GRAND—400—Broadway and 31st	1.00	....	1.50	....	....
PARK AVENUE—430—Park Ave. and 32d	1.50 to 2.00	2.50 to 4.00	3.00	4.00 to 5.00	....
PLAZA—750—5th Ave. and 58th	....	....	3.50	4.00	7.00 to 10.00
PRINCE GEORGE—750—5th Ave. and 28th	....	....	2.50	4.00	....
RITZ-CARLTON—425—Madison Ave. and 46th	....	....	5.00	7.00 to 10.00	....
RUTLEDGE—250—Lexington and 30th (women only):					
European	1.00	2.00	1.50	2.50	....
American	2.50	5.00	3.00	6.00	....
ST. MARGARET—130—129 W. 47th	1.00	....	1.50	....	3.50 .....
ST. PAUL—225—50th St. and Columbus Ave	1.00	2.00	2.00	3.00	....
ST. REGIS—340—Fifth Ave. and 55th	4.00	5.00	5.00 to 6.00	6.00 to 10.00	....
SAN REMO—600—Central Pk. W. and 74th	....	....	2.00	2.50	4.00 to 5.00
SEVILLE—475—Madison Ave. and 29th	1.50	2.50	2.50	3.00	....
SHERMAN SQUARE—500—Broadway and 70th	....	....	2.00 to 2.50	....	....
SOMERSET—225—150 W. 47th	2.00	3.00	....	....	4.00 .....
UNION SQUARE—130—15th St. and 4th Ave	1.50 to 2.00	3.00 to 4.00	....	....	4.00 to 7.00
VANDERBILT—600—34th St. and Park Ave	....	....	3.00	5.00	....
VAN RENSSELAER—200—11th St. near 5th Ave:					
European	....	....	1.50	2.00	2.50 to 3.00
American	....	....	3.00	5.00	6.00 to 8.00
WALLICK—400—Broadway and 43d	1.50 to 2.00	2.50 to 3.00	2.00 to 3.00	4.00 to 6.00	....
WEBSTER—160—40 W. 45th	....	....	2.50	3.50	4.00 .....
WILLARD—130—252 W. 76th	....	....	1.50	2.00	....
WOLCOTT—300—31st St. and Fifth Ave	2.00	....	2.50	5.00	....
WOODSTOCK—365—43d St. near Broadway	2.00	3.00	2.50	3.50	5.00 to 8.00
WOODWARD—400—Broadway and 55th	1.50	....	2.00	3.00	4.00 .....
YORK—250—Seventh Ave. and 36th	1.50 to 2.00	2.50 to 3.00	2.00 to 3.00	3.50 to 5.00	....

* For definite information concerning accommodations offered and rates, write to the hotels.

Marriages

EDWARD E. MONTGOMERY, M.D., Philadelphia, to Miss Alice Jayne of Tarrytown, N. Y., at Yonkers, N. Y., February 6.

ALBERT THOMAS GRILLS, M.D., to Miss Gertrude Chapman, both of Lorain, Ohio, in Cleveland, January 25.

PHILIP JOHN MURPHY, M.D., Washington, D. C., to Miss Helen Rasmussen of Chicago, February 3.

MONROE A. MAAS, M.D., Selma, Ala., to Miss Beulah A. Houseman of Shrewsbury, Pa., January 24.

FRANCIS XAVIER MAHONEY, M.D., to Miss Elizabeth C. Robinson, both of Boston, January 29.

JOHN ROSCOE STEAGALL, M.D., to Miss Gertrude Irene Still, both of Tacoma, Wash., January 18.

WALLER HALLADAY DADE, M.D., Manila, P. I., to Miss Clara Everhart of Norfolk, Va., recently.

JOHN P. ZOHLEN, M.D., Sheboygan, Wis., to Miss May Weiss of Milwaukee, January 17.

HENRY J. ROTH, M.D., to Miss Annabell McAuley, both of Chicago, January 27.

Deaths

William Mabon, M.D., New York; Bellevue Hospital Medical College, 1881; aged 56; a member of the Medical Society of the State of New York and American Medico-Psychological Association; assistant physician to the Morris Plains (N. J.) State Hospital from 1885 to 1887, and of the Utica (N. Y.) State Hospital from 1887 to 1895; superintendent of the Willard (N. Y.) State Hospital in 1895 and 1896, and of the St. Lawrence (N. Y.) State Hospital from 1896 to 1903; general superintendent of Bellevue and Allied hospitals, New York, in 1903 and 1904, and superintendent of the Manhattan State Hospital since 1906; lecturer on mental diseases in his alma mater in 1907; president of the New York State Commission in Lunacy from 1904 to 1906; one of the best known alienists in the country; died at his home, February 9, from pneumonia.

Eugene Adelbert Chapman, M.D., Stafford Springs, Conn.; University of Buffalo, N. Y., 1862; aged 77; formerly a member of the Connecticut State Medical Society; a veteran of the Civil War, and afterward captain and assistant surgeon, U. S. Army; quarantine officer at Brazos, Texas, in 1865; postmaster of Henderson, N. Y., in 1872 and 1873; coroner of Jefferson County in 1870 and 1886; for nine years a member of the board of county supervisors and once its chairman; county clerk of Jefferson County from 1900 to 1906; died at his home, January 29, from cerebral hemorrhage.

Amos Rufus Solenberger, M.D., Colorado Springs, Colo.; Northwestern University Medical School, Chicago, 1885; aged 63; a Fellow of the American Medical Association; for several years a practitioner of Chicago, and instructor of laryngology, rhinology and otology in his alma mater from 1896 to 1899; a member of the American Academy of Medicine and American Laryngological, Rhinological and Otological Society; a specialist on diseases of the ear, nose and throat; who went to Colorado in 1902 on account of ill health; died in Colorado Springs, February 4.

Asa Stone Couch, M.D., Scranton, Pa.; Homeopathic Medical College of Philadelphia, 1855; aged 83; one of the most prominent men of his school in the East; first president of the New York State Board of Medical Examiners and of the New York State Homeopathic Medical Society; one of the founders of the New York State Hospitals at Middletown and Tonawanda and president of the board of directors of each of these institutions; died at the home of his son in New York, February 2.

James Howell Billingslea, M.D., Westminster, Md.; University of Maryland, Baltimore, 1864; aged 73; a member of the Medical and Chirurgical Faculty of Maryland; for fifty-two years a practitioner of Westminster; president of the Union National Bank; Consolidated Public Utilities Company and *Democratic Advocate* Publishing Company; died at his home, January 29, from cerebral hemorrhage.

Ernest Edwin Martin, M.D., Mead, Colo.; College of Physicians and Surgeons, Chicago, 1900; aged 46; formerly a Fellow of the American Medical Association; for three years surgeon for the Union Pacific System at Carr, Colo.; formerly city physician of Del Norte, Colo., and physician of Rio Grande County; died in the Longmont Hospital, Longmont, Colo.; January 25, from pneumonia.

Henry J. Burwash, M.D., Chicago; McGill University, Montreal, 1879; L.R.C.P., London, 1879; aged 62; a Fellow of the American Medical Association; surgeon to the Norwegian Lutheran Deaconess Hospital; corporation surgeon for the General Accident Assurance Company; for a long time surgeon for the Northwest Mounted Police of Canada; died at his home, February 7, from pneumonia.

John Emil Wadsworth, M.D., Skowhegan, Me.; Medical School of Maine, Brunswick, 1896; aged 46; a Fellow of the American Medical Association; founder of the Somerset Hospital, Skowhegan; chairman of the State Board of Registration for Nurses; physician to the State Women's Reformatory, Skowhegan, and school physician; died at his home, January 29, from pneumonia.

Henry Aloysius Towle, M.D., Newark, N. J.; College of Physicians and Surgeons in the City of New York, 1888; aged 56; a Fellow of the American Medical Association; laryngologist to the German Hospital and City Dispensary of Newark; a member of the visiting staff of St. James' and St. Michael's hospitals, Newark; died at his home, January 29, from heart disease.

James S. Porteus, M.D., Scranton and Taylor, Pa.; University of Pennsylvania, Philadelphia, 1873; aged 76; formerly a member of the Medical Society of the State of Pennsylvania; also a druggist; postmaster of Taylor from 1889 to 1894; for more than fifteen years visiting physician of the Pittston Poor District; died at his home in Taylor, January 26.

Fortis Monroe Noble, M.D., Bloomingdale, N. Y.; University of Vermont, Burlington, 1890; aged 52; formerly a member of the Medical Society of the State of New York; attending physician to St. Gabriel's Sanatorium, in the Adirondacks for twenty years; for two years coroner of Essex County; died at his home, January 19, from pneumonia.

John Leddell Seward, M.D., Orange, N. J.; University of Pennsylvania, Philadelphia, 1867; Hahnemann Medical College, Philadelphia, 1873; aged 72; governor and consulting physician to St. Mary's Hospital, Passaic, N. J.; surgeon of volunteers during the Civil War; died at the Interpines Sanatorium, Goshen, N. Y., January 29.

Clement P. Wilkinson, M.D., New Orleans; Tulane University, New Orleans, 1874; aged 65; from 1884 to 1888 president of the Louisiana State Board of Health; assistant quarantine physician and quarantine physician, and for a time acting assistant surgeon, U. S. Army; died at his home, January 31, from cerebral hemorrhage.

Charles Allison Oaks, M.D., Ingleside, Neb.; John A. Creighton Medical College, Omaha, Neb., 1902; aged 38; formerly a Fellow of the American Medical Association; a member of the Nebraska State Medical Association; second assistant physician at the Ingleside Hospital for the Insane; died, January 25, from pneumonia.

Frederick J. Harter, M.D., Herkimer, N. Y.; College of Physicians and Surgeons in the City of New York, 1880; aged 61; a member of the Medical Society of the State of New York; who served for several terms as president of the village of Moravia and local health officer; died at his home, January 20, from pneumonia.

James Strong Billingsley, M.D., Belleville, Kan.; Rush Medical College, 1883; aged 59; a member of the Kansas Medical Society; local surgeon of the Rock Island System, and secretary of the Republic County Board of Health; died in Stormont Hospital, Topeka, Kan., January 26, from endocarditis.

Carl von Arx Schneider, M.D., Gowanda, N. Y.; Cleveland Homeopathic Medical College, 1904; aged 37; a member of the Medical Society of the State of New York; assistant superintendent of the Gowanda State Hospital for eleven years; died in that institution, January 29, from typhoid fever.

Roderick Campbell McLeod, M.D., North Sydney, N. S.; New York University, New York, 1891; Lieutenant-Colonel, Canadian Army Medical Corps, and in command of the unit offered by the University of St. Francis Xavier, Nova Scotia; died in Bramshott Camp, England, January 7, from anthrax.

Albert Clarence Lane, M.D., Woburn, Mass.; Long Island College Hospital, Brooklyn, 1879; aged 65; a member of the Massachusetts Medical Society; who was taken to the Massa-

chusetts General Hospital, Boston, January 26, for a surgical operation; died at that institution, February 1.

John A. Hoffmeyer, M.D., Buffalo; University of Buffalo, N. Y., 1880; aged 63; a member of the Medical Society of the State of New York; county medical examiner for Erie County in 1882 and for many years a district physician; died at his home, January 26, from heart disease.

Amelia Ann Duran Dickinson, M.D., Evansville, Ind.; Hering Medical College, Chicago, 1900; aged 42; a Fellow of the American Medical Association; assistant physician to the Southern Indiana Hospital for the Insane, Evansville; died in Evansville, February 8, from pneumonia.

George Henson Davis, M.D., Brooklyn; Long Island College Hospital, 1895; aged 43; formerly a member of the Medical Society of the State of New York; a member of the staff of Trinity and Bushwick hospitals, Brooklyn; died at his home, January 28, from disease of the throat.

Nicholas Henry Freeland, M.D., Tarrytown, N. Y.; Bellevue Hospital Medical College, 1867; aged 72; president of the Tarrytown Water Board; formerly surgeon of the Sixteenth Battalion, N. G., S. N. Y.; died at his home, January 24, from carcinoma of the stomach.

Samuel West, M.D., Idalia, Mo.; College of Physicians and Surgeons, Keokuk, Iowa., 1879; aged 61; a member of the Missouri State Medical Association, and for many years a practitioner and druggist; died at his home, January 22, from pneumonia.

Thomas William Musgrove, M.D., Sultan, Wash.; Harvard Medical School, 1871; aged 75; a member of the Washington State Medical Association; for five years town clerk of Sultan; died at his home in that place, January 23, from heart disease.

Julius L. Philipp Hoffmann, M.D., New York; University of Berlin, Germany, 1876; aged 76; formerly a member of the Medical Society of the State of New York; one of the first board of directors of the *Volkszeitung;* died at his home, January 25.

Ebenezer W. Schooley, M.D., Toledo, Ohio; Eclectic Medical Institute, Cincinnati, 1872; aged 75; formerly local surgeon for the Cincinnati, Hamilton and Dayton system; a veteran of the Civil War; died at his home, about January 18.

Edgar Hart, M.D., Pennington, N. J.; University of Pennsylvania, Philadelphia, 1871; aged 60; president of the Borough Board of Health and vice president of the board of trade; died at his home, January 28, from heart disease.

Johan Adam Lauer, M.D., Leavenworth, Kan.; Kaiser Wilhelms University, Strassburg, Germany, 1884; aged 68; for more than thirty years a practitioner of Leavenworth; died at Cushing Hospital in that city, January 23, from pneumonia.

Horace A. Talley, M.D., Wentzville, Mo.; Medical College of Virginia, Richmond, 1884; aged 63; while driving in his automobile over a grade crossing in Wentzville, January 30, was struck by a Wabash train and instantly killed.

William Berrien Burroughs, M.D., Brunswick, Ga.; Savannah (Ga.) Medical College, 1867; aged 74; a Confederate veteran; an authority on the history of Georgia and the South Atlantic Coast; died at his home, January 21.

Charles M. Wheeler, M.D., Stockton, Calif.; Bennett Medical College, Chicago, 1881; aged 66; who had been blind for about seven years as a result of exposure to Roentgen rays; died at his home, January 22.

Cassius J. Logans, M.D., South Glens Falls, N. Y.; University of Vermont, Burlington, 1879; aged 71; a veteran of the Civil War, in which he served in the United States Navy; died at his home, January 18.

Farrington Wilkes, M.D., Oakland, Calif.; University of California, San Francisco, 1894; formerly a member of the Medical Society of the State of California; died at his home, January 26.

Eliza Knowles Morgan, M.D., Lawrence, Kan.; Cleveland Homeopathic Medical College, 1864; aged 82; for many years a resident of Leavenworth, Kan., and director of the Cushing Hospital; died at her home, January 14.

William Lidderdale Goddard, M.D., Saulsbury, Tenn.; Memphis (Tenn.) Hospital Medical College, 1890; aged 68; a Fellow of the American Medical Association; died at his home, December 6, from nephritis.

James Buell Thompson, M.D., Prospect, Pa.; Jefferson Medical College, 1889; aged 55; a member of the Medical Society of the State of Pennsylvania; died at his home, December 24, from cerebral hemorrhage.

Jasper M. Stuart, M.D., McGehee, Ark.; Louisville (Ky.) Medical College, 1900; aged 49; formerly a Fellow of the American Medical Association; died at his home, January 18, from cerebral hemorrhage.

James K. Waters, M.D., Thurmont, Md.; University of Maryland, Baltimore, 1869; aged 78; registrar of wills of Frederick County for six years; president of a bank, and a druggist; died recently.

David J. Merriman, M.D., Painesville, Ohio; Detroit Medical College, 1870; aged 81; formerly a member of the Ohio State Medical Association; died in the German Hospital, Cleveland, January 14.

William S. Hart, M.D., Lake Odessa, Mich.; Western Reserve University, Cleveland, 1881; aged 77; a pioneer practitioner and druggist of Ionia County, Mich.; died at his home, January 20.

John E. Younglove, M.D., Bowling Green, Ky.; Homeopathic Medical College of Missouri, St. Louis, 1861; aged 90; also a druggist; died at his home, January 2, from cerebral hemorrhage.

Charles Edward Humphrey, M.D., Bethlehem, Pa.; University of Pennsylvania, Philadelphia, 1863; aged 74; surgeon of U. S. Volunteers during the Civil War; died at his home, January 20.

David Seely Adams, M.D., Macomb, Ill.; Keokuk (Iowa) Medical College, 1900; aged 60; a Fellow of the American Medical Association; died at his home, January 24, from pneumonia.

John J. Devine, M.D., Tom Bean, Tex.; Atlanta (Ga.) Medical College, 1875; aged 65; formerly a member of the State Medical Association of Texas; died at his home, January 19.

David F. Sullivan, Frankfort, S. D. (license, South Dakota, 1887); aged 72; a practitioner since 1869; vice president of the Spink County Board of Health; died at his home, January 10.

Mary A. Latham, M.D., Spokane, Wash.; Cincinnati College of Medicine and Surgery, 1886; aged 72; died in the Sacred Heart Hospital, Spokane, January 20, from pneumonia.

Benjamin Franklin O'Daniel, M.D., Denver; University of Louisville, Ky., 1874; aged 66; died at Mount Airy Sanatorium, Denver, October 15, from chronic interstitial nephritis.

James Henry Wilkerson, M.D., Knoxville, Tenn.; Tennessee Medical College, Chattanooga, 1892; aged 50; a Fellow of the American Medical Association; died at his home, January 1.

Charles Valores Webb, M.D., Wallingford, Conn.; Hahnemann Medical College, Philadelphia, 1898; aged 44; died in the Middletown (Conn.) State Hospital, December 26.

Gordon White, Nashville, Tenn.; Baltimore College of Dental Surgery, 1879; aged 59; a Fellow of the American Medical Association; died at his home, December 6.

Morris Pitcher, M.D., Sardinia, N. Y.; Tuft's College Medical School, 1900; aged 31; a specialist in diseases of the eye, ear, nose and throat; died at his home, January 17.

Charles Hope Mullen, M.D., Foster, Ky.; University of Nashville, Tenn., 1858; aged 78; a veteran of the Civil War; died at his home, January 12, from senile debility.

William F. Phillips, M.D., Wilmore, Ky.; University of Louisville, Ky., 1893; who was stricken with paralysis eight weeks before; died at his home, January 19.

Nathan A. Mossman, M.D., New York; New York Homeopathic Medical College, New York, 1861; aged 79; died in his apartments in New York, January 15.

William R. Blossom, Caribou, Me. (license, Vermont, 1903); aged 58; a member of the Maine Medical Association; died at his home, about January 2.

Charles J. Holmgren, M.D., Oakland, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1889; aged 82; died at his home, January 18.

Samuel Houston Ridenour, M.D., Pittsburgh; University of Pittsburgh, 1890; aged 58; died at the home of his sister in Cumberland, Md., January 1.

John J. Ryan, M.D., East St. Louis, Ill.; American Medical College, St. Louis, 1878; aged 72; died in St. Mary's Hospital, East St. Louis, January 20.

W. L. Noel, Boaz, Ala. (license, LaMar County, Ala.); aged 68; a practitioner and druggist; died, November 23.

Z. N. Young, Lafayette, Tenn. (license, Tennessee, 1889); aged 75; died at his home, about January 17.

Thomas G. Welch, Mount Scott, Okla. (license, Oklahoma); aged 80; died at his home, December 21.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

FIRWEIN

Report of the Council on Pharmacy and Chemistry

Firwein is a product of The Tilden Company, New Lebanon, N. Y. It is sold under the claim that when swallowed it has a "predilection" both for the bronchial mucosa and also for the genito-urinary organs. To quote:

"Expectorant, Sedative, Antispasmodic in the Treatment of Inflammations of the Bronchial and Genito-Urinary Mucoisae."

"Firwein being a bland, soothing balsam possesses a wide range of adaptability and increased potency because of its healing virtues and usefulness as an expectorant, sedative and antispasmodic in bronchitis, and inflammation and catarrh of nose, throat and lungs."

"Firwein has a special predilection for mucosae, this being as marked in diseases of the genito-urinary system as it is in the respiratory organs. In inflammatory diseases of the genito-urinary organs, its bland, curative properties are exerted in a gratifying degree. In cystitis and urittis it is clearly indicated. . . ."

Little information is given concerning the composition of Firwein. An old circular says:

"Firwein contains Phosphorus, Iodin and Bromin finely blended with a balsamous elixir made from the fir tree."

From a more recent circular we quote:

"Firwein is prepared from the inside fresh green bark of the fir tree . . ."

The label on the product reads:

"Firwein is pleasantly and effectively blended with salts of iodin and bromin, held in solution with 20 per cent. alcohol."

The therapeutic claims made for Firwein and the mystery enshrouding its composition make it obvious that the product is intended to appeal to those who are either thoughtless or ignorant. This is emphasized by the suggestion that Firwein be combined with (1) cod liver oil (under the claim that it will "promote the efficiency of the oil"), with (2) whisky for the treatment of bronchorrhea of the aged, and with (3) syrup of hypophosphites for the treatment of persistent bronchitis.

As the composition of Firwein is secret, the therapeutic claims unwarranted and its use irrational, the Council declared it inadmissible to New and Nonofficial Remedies.

FIROLYPTOL PLAIN AND FIROLYPTOL WITH KREOSOTE

Report of the Council on Pharmacy and Chemistry

Firolyptol, another product of The Tilden Company, is, we are told, composed of eucalyptol 10 drops, cottonseed oil ½ ounce and Firwein enough to make 1 ounce. As the composition of Ferwein is secret, it is evident that the composition of Firolyptol is also unknown, except to the manufacturers. "Firolyptol with Kreosote" is said to contain, in addition to whatever may be the component parts of Firolyptol, 10 minims of creosote to each ounce. According to an advertisement, Firolyptol with Kreosote is "antituberculous, antistrumous" and "contains all the desired features of cod liver oil and is readily assimilated."

The advertisements of "Firolyptol Plain" and "Firolyptol with Kreosote" seem to have for their key-note the assertion that cottonseed oil is a particularly valuable nutriment and that when combined with constituents of Firolyptol and Firolyptol with Kreosote becomes particularly valuable to the tuberculous. To quote from an advertising circular:

"Now that the reconstructive properties of cottonseed oil are better appreciated by the profession, the advantages that follow the administration of a palatable emulsion of this strengthening and fattening food product are being demonstrated in hundreds of cases where formerly reliance would have been placed in cod liver oil. . . . A recent writer says that pure cottonseed oil is the greatest and purest vegetable oil known to chemistry, and will do much toward revolutionizing the treatment of the GREAT WHITE PLAGUE. . . . If the treatment of tuberculosis could resolve itself into the administration of a fatty substance in a readily assimilated form, there would be no need for any part of FIROLYPTOL but the Cottonseed Oil. . . . The toxic material constantly produced in the system by the germs of tuberculosis tend to expose it more and more to the ravages of the disease, and the physiologic functions of the body suffer a constant depression. To neutralize this germ activity with a consequent production of toxins it seems most logical to employ such agents as have demonstrated their suitability for such purposes, for which reason Eucalyptol and Kreosote with Firwein are incorporated in FIROLYPTOL."

The assertion that cottonseed oil is an especially valuable form of fat is without warrant, but even if it were true the fat is available in cheap and palatable forms in numerous other cottonseed oil products. It is unnecessary to discuss the problematical value of creosote in the treatment of tuberculosis or the value of eucalyptol (now generally abandoned) or even of the secret mixture Firwein. Food and fresh air, not drugs, constitute the fundamentals of the treatment of tuberculosis and it is both irrational and detrimental to the interests of the tuberculous to administer various potent agents in fixed and unknown amounts with such simple articles of food as cottonseed oil. Neither of these products is acceptable for New and Nonofficial Remedies.

EDITORIAL NOTE.—Firwein[1] has been advertised to physicians for twenty-five or thirty years and it is a sad commentary on the intelligence of our profession that a preparation sold under such obviously false and misleading, not to say silly, claims, should still be in existence. Firwein is claimed to "prevent waste of tissue" in tuberculosis. If it had this power, it would have found its place long ago among the few great agents in drug therapy. As a matter of fact, Firwein has gained virtually no recognition outside of the "literature" of the Tilden concern. The claims made for Firwein are a peculiar mixture of studied candor—when the truth is not likely to hurt its sale—and inane vaporing—when the facts would not redound to its credit. The Tilden Company declares that "Firwein stands without a peer in its class." But the company adds 10 drops of eucalyptol and some cottonseed oil to this peerless product and an improvement is born—"Firolyptol"! Then, to perfect the already perfectly perfected, 10 drops of creosote are added to "Firolyptol" and the profession is offered "Firolyptol with Kreosote"! In just what verbal pyrotechnics the Tilden Company might indulge, should it decide to add ten drops of something else to "Firolyptol with Kreosote," one shudders to contemplate.

If we are accused of exhibiting undue levity in discussing a therapeutic problem, we can only answer that it is impossible to consider seriously the Charlie Chaplins of the nostrum world. The following medical journals have, during 1916, carried advertisements either of Firwein or Firolyptol with Kreosote or both:

Illinois Medical Journal
American Journal of Surgery
Medical Review of Reviews
Pediatrics
Charlotte Medical Journal
Indianapolis Medical Journal
Medical Summary
Medical Sentinel
Louisville Monthly Journal of Medicine and Surgery
Western Medical Times
Texas Medical Journal
Pacific Medical Journal
Medical World
Buffalo Medical Journal
Medical Herald
Southern Practitioner
Medical Fortnightly
International Journal of Surgery
Medical Times

MORE MISBRANDED NOSTRUMS

Collins' Ague Remedy, Swaim's Panacea and Swayne's Panacea.—James F. Ballard, St. Louis, was made the defendant in three cases brought by the federal government against the respective products named. "Collins' Ague Remedy" which admittedly contained 33.3 per cent. alcohol was sold under the claim that it was an effective remedy for chills and fever, dysentery, most forms of malarial diseases, intermittent, remittent and swamp fevers, cholera morbus and diarrhea. These claims the government declared were false

1. Three other Tilden products have been the subject of deserved and unfavorable comment in THE JOURNAL: "Narkine" in the issue of Oct. 24, 1908, "Hydrocyanate of Iron-Tilden" in the issue of June 19, 1909, and "Febrisol," in the issue of June 29, 1912. The first two articles are reprinted in the latest (9th) edition of "The Propaganda for Reform."

and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. "Swaim's Panacea" was found to contain nearly 5 per cent. alcohol with 62.3 per cent. of solids, of which 58.5 per cent. was sugar. There was also $\frac{1}{10}$ of 1 per cent. salicylic acid and some sarsaparilla present. The public was asked to believe that this stuff was effective as a remedy and panacea for syphilis, pulmonary diseases, eczema, influenza, anemia, consumption and a great many other things. These claims were declared to be false and fraudulent and made knowingly and wantonly. "Swayne's Panacea" seemed to be very similar in composition to "Swaim's Panacea" and was sold under claims virtually identical with those made for the latter product. The government officials naturally declared these claims false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. James F. Ballard pleaded guilty and was fined $30 and costs.—[*Notice of Judgment No. 4373.*]

Croxone.—The American Croxone Co., Cleveland, Ohio, distributed this product. The government chemists reported that each small box of the product contained 32 capsules in each of which was a white-coated pill and a red oil. The oil was essentially a small amount of oil of pine or oil of juniper dissolved in a fatty oil or mixture of oils. The pill consisted

essentially of strychnin, a trace of brucin, aloin, hexamethylenamin, lithium carbonate, potassium nitrate and probably a trace of atropin. The stuff was sold as a "cure" for rheumatism and kidney disease and a preventive of dropsy and "gravel." These claims were declared false and fraudulent and applied knowingly. The company pleaded guilty and was fined $25 and costs.—[*Notice of Judgment No. 4386.*]

Freeman's Balsam of Fir Wafers.—Edgar S. Fossett, who did business under the name Freeman Pharmacal Company, Portland, Maine, manufactured "Dr. Freeman's Balsam of Fir Wafers" which the government declared misbranded. Federal chemists reported that the lozenges consisted of sugar with very small amounts of oil of turpentine and eucalyptus with the possible presence of a trace of balsam of fir. They were sold under the claim that they were an effective remedy for relieving consumption and for stopping the "raising of blood in consumption" and effective also as a remedy for all affections of the throat and lungs, bronchitis, asthma, croup, whooping cough, la grippe, etc. These therapeutic claims were declared false and fraudulent and applied knowingly and wantonly. Furthermore, the fact that the name of the product would indicate that the article contained an appreciable amount of balsam of fir (which it did not) further constituted misbranding. Edgar S. Fossett entered a plea of *nolo contendere* and was fined $40.—[*Notice of Judgment No. 4391.*]

Renne's Pain Killing Oil.—This was another preparation put out by James F. Ballard of St. Louis, who in this case did business under the trade name "Dr. Herrick Family Medicine Co." The chemists of the Bureau of Chemistry declared that analysis showed it to be essentially a water-alcohol solution of sassafras oil and cayenne pepper containing 78.6 per cent. alcohol and 4 per cent. volatile oils. There were also indications that the stuff contained a little mustard oil and soap. The government charged Ballard with falsely and fraudulently claiming, in reckless and wanton disregard of the truth of the statements, that this stuff was a reliable remedy for cholera, diphtheria, rheumatism, croup and a number of other conditions. Ballard pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 4400.*]

Schuh's Yellow Injection and Schuh's White Mixture.—The Schuh Drug Co., Cairo, Ill., put both these products on the market. The first was sold under the claim that it was "a Speedy Cure for Gonorrhea and Gleet. Cures in 3 to 5 days." The federal chemists reported that Schuh's Yellow Injection was an aqueous solution of boric acid, carbolic acid and berberin. The government charged, naturally, that the therapeutic claims made for this nostrum were wantonly and recklessly false and fraudulent. The second preparation, "Schuh's White Mixture," also was analyzed by the government chemists who reported that it was a mixture of mucilage of tragacanth, balsam of copaiba, and probably sandalwood oil, flavored with cassia. This stuff was sold as "a Safe and Certain Cure for Gonorrhea and Gleet. Cures in 3 to 5 days" and other similar claims. These, of course, were declared false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. The Schuh Drug Company pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 4396.*]

Elmore's R'eumatine Goutaline.—"Dr. D. M. Elmore's R'eumatine Goutaline" was put on the market by George Bayne, Bayonne, N. J., under the claim that it was a remedy for all rheumatic disorders and all forms of rheumatism and a remedy for all disorders of the kidneys, liver and bladder, besides being effective for curing malaria. The government chemists reported that the stuff was apparently a dilute tincture of colchicum. The claims made for it were declared false and fraudulent and applied wantonly and recklessly. George Bayne pleaded guilty and was fined $10.—[*Notice of Judgment No. 4374.*]

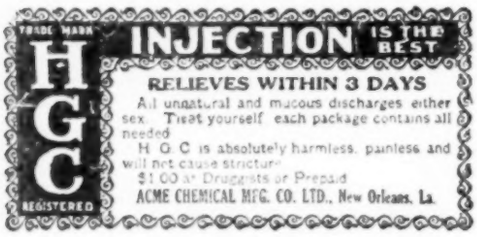
Armstrong's Croup Ointment.—Harold G. Carpenter and Herman J. Pierce manufactured and sold this product under the trade name, Carpenter & Pierce Co., Troy, Pa. It was claimed to be a cure for croup, catarrh, asthma, and cold in the head, throat or lungs. The government chemists reported that this ointment contained eucalyptus oils and traces of other oils, possibly cassia and thyme. The therapeutic claims were declared to be false and fraudulent. A plea of *nolo contendere* was entered by the defendants, who were fined $10 and costs.—[*Notice of Judgment No. 4375.*]

Anticephalalgine.—The defendant in this case was James I. Johnson, a corporation, Raleigh, N. C. The stuff admittedly contained 30 per cent. alcohol and 4 grains acetanilid to the ounce. The government chemists reported that it also contained sodium bromid, sodium salicylate, caffein and antipyrin. It was sold under the claim that it was a cure for all kinds of headaches, claims that the government officials declared were knowingly false and fraudulent. The defendant pleaded guilty and on payment of costs the court suspended judgment.—[*Notice of Judgment No. 4376.*]

Wright's Rheumatic Remedy.—The Wright Medicine Company, Peru, Ind., made this preparation which, according to government chemists, was an emulsion composed principally of turpentine, methyl salicylate, sugar, acacia, and water, with

probably some resinous or plant extractive matter. It was sold under the claims that it was an effective remedy for gallstones and a specific remedy for kidney and bladder troubles. These claims were characterized by the government as false and fraudulent and made knowingly and in reckless and wanton disregard of their truth or falsity. The company pleaded guilty and was fined $50 and costs.—[*Notice of Judgment No. 4398.*]

H G C.—This preparation was manufactured and sold by the Acme Chemical Mfg. Co., New Orleans, La. According to the government chemists, the product was a watery solu-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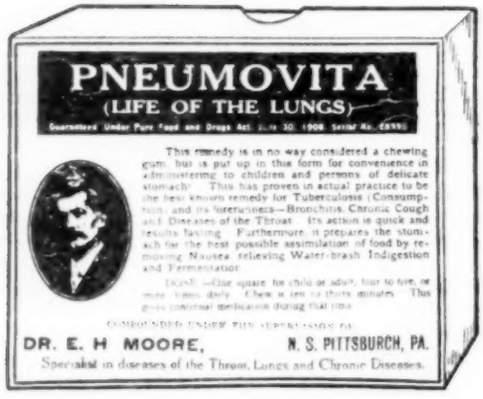
ACME CHEMICAL MFG. CO. LTD., New Orleans, La.

tion of borax and berberin sulphate. It was sold under the claim that it was a cure for gonorrhea, gleet and leucorrhea, a claim that was declared false and fraudulent. The company pleaded guilty and was fined $100 and costs.—[*Notice of Judgment No. 4397.*]

Russell's White Drops.—This "soothing syrup" was manufactured by the Russell Medicine Co., Providence, R. I. and was sold under the claim that it was an invaluable remedy for the relief and cure of diarrhea and dysentery; that it would prevent convulsions and was a remedy for cholera infantum and all diseases incident to children, especially during teething. Further, that it would give new life and vigor to the whole system. The claim also was made that it contained nothing that would injure the most delicate child. Government chemists reported that the stuff contained from 15 to 16 per cent. of alcohol as well as codein, a poisonous and harmful drug. The therapeutic claims were declared false and fraudulent and applied knowingly and wantonly. The company pleaded guilty and was fined $20.—[*Notice of Judgment No. 4388.*]

Pneumovita.—Edwin H. Moore, Pittsburgh, Pa., sold this stuff as "the best remedy known for Tuberculosis, (Consumption) and its forerunners—Bronchitis, Chronic Cough


PNEUMOVITA
(LIFE OF THE LUNGS)
Guaranteed Under Pure Food and Drugs Act, June 30, 1906 Serial No. 6895
This remedy is in no way considered a chewing gum, but is put up in this form for convenience in administering to children and persons of delicate stomach. This has proven in actual practice to be the best known remedy for Tuberculosis (Consumption) and its forerunners—Bronchitis, Chronic Cough and Diseases of the Throat. Its action is quick and results lasting. Furthermore, it prepares the stomach for the best possible assimilation of food by removing Nausea, relieving Water-brash, Indigestion and Fermentation.
DOSE.—One square for child or adult, four to five, or more times daily. Chew it ten or fifteen minutes. This gives constant medication during that time.
COMPOUNDED UNDER THE SUPERVISION OF
DR. E. H. MOORE, M. S. PITTSBURGH, PA.
Specialist in diseases of the Throat, Lungs and Chronic Diseases.

and Diseases of the Throat." The government chemists reported that the stuff was a sweetened gum, containing small amounts of charcoal and iron phosphate having a wintergreen flavor. Of course the claims made were declared false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. Edwin H. Moore entered a plea of *nolo contendere*. The court imposed a fine of 6¼ cents, with costs of $15.07.—[*Notice of Judgment No. 4394.*]

Correspondence

Sodium Cacodylate in the Treatment of Syphilis

To the Editor:—Dr. William G. Ward's letter (THE JOURNAL, Feb. 3, 1917, p. 390), and the recent admirable article by Dr. Harold N. Cole (THE JOURNAL, Dec. 30, 1916, p. 2012) recall to mind Dr. J. B. Murphy's clinical note on the use of sodium cacodylate in the treatment of syphilis (THE JOURNAL, Sept. 24, 1910, p. 1113), and the experimental work of Capt. H. J. Nichols, U. S. Army (THE JOURNAL, Feb. 18, 1911, p. 492). The results of Nichols' work conclusively proved, at least from a laboratory standpoint, that this drug was of very little value as a spirocheticide in combating syphilis. Prior to the publication of Dr. Murphy's letter, I had employed sodium cacodylate extensively as a remedy in psoriasis, and I still continue to use it in selected cases of the disease.

Adopting Dr. Murphy's suggestion, I gave the agent an extensive trial in syphilis in all stages of the disease. The results were extremely disappointing, from both clinical and serologic points of view. More recently, during the scarcity of salvarsan, I gave the drug a second trial, employing it in large dosage in the hope that the previous failure had been due to the employment of insufficient amounts. The results were not tabulated, but, judging roughly from my experience in a score of cases, its therapeutic value as an antisyphilitic was nil. A few of the patients underwent a temporary improvement, probably owing to the tonic effect of the drug, but in every instance the serologic findings were unaffected.

R. L. SUTTON, M.D., Kansas City, Mo.

Compulsory Health Insurance

To the Editor:—Your invitation to discuss health insurance is too attractive to be ignored. During the past eight months I have read many articles by American physicians on the subject, and I have been saddened by the general tone of quiescent acceptance. Those advocating insurance are entirely altruistic. This group is not composed of employers, but employers will welcome the move so far as it increases economic efficiency better than other methods. The altruistic workers are depending on the medical profession to educate the insured to want insurance and to keep its own remuneration low enough to make the plan feasible.

Dr. Lambert has had unequaled opportunity, and is probably the best informed man in the medical profession on this subject. He makes no mention of advantages pro or con, but contents himself with discussing details. This assumption that the thing must be I consider a mistake. It is the mistake which harassed the profession in England in 1912 and caused the failure of its combative efforts.

Dr. Lambert's report states that, after twenty-five years' experience, European countries have concluded that any plan for voluntary insurance is a failure. The profession agrees with insurance workers in this conclusion. These countries then decide that the remedy is compulsory insurance. Since volition is a failure, then compulsion must be successful. This reasoning is insufficient, yet five countries in a period of three years did adopt it. Sufficient time has elapsed in these instances to prove that friction is continually present and will continue to be until such time as free choice of physician and unchanged relationship between patient and physician may be allowed, instead of a commercial physician hired by a third party and called through expediency. This point is the greatest stumbling block that has been encountered, and it is so entirely because of increased and prohibitive expense. Patients want it and the profession wants it, yet it has been necessary to ride over it with no one achieving satisfaction except the carrier of insurance.

As to relative conditions, the report of the American Medical Association Health Insurance Committee shows that Norway under a voluntary plan insures 25.8 per cent.; England, before the act of 1912, insured 31 per cent., and France, voluntary, 10 or 12 per cent. In the United States it is estimated

that labor unions alone insure 10 per cent., so that, when other agencies are accounted for, it seems that we are in fully as good a position as were European countries previous to the adoption of compulsory plans.

Under the compulsory plan Germany has seen physicians go on strike after ten years over the free choice contention, has seen their clientele uphold them to the defeat of strike-breakers and of the organization, has temporized, and the end is not yet. England at present deplores the fact that its medical profession has not improved the quality of its work as was planned in 1912. Just how or why a physician could or should improve as a salaried commercialist over what he was as a friend, trusted by choice with the lives and health of his clientele, is not clear, especially when he is handicapped by more pieces of work at a smaller rate of recompense. It was, however, in the plan that he should improve, and the fact that improvement has not occurred is a bitter disappointment which is now producing complaint.

None of these five countries has yet proved that compulsory insurance can be continuingly operated with satisfaction to all, or even to any, of the three parties concerned—and this under forms of government in which policies can be stable and reasonably permanent! One of the misfortunes of our form of government is that no policy which works any dissatisfaction, even though it is a good policy, can be maintained with any reasonable degree of preplanning or permanence: a quadrennial upheaval may change all arrangements which have been made, by injecting into the administration a new personnel with fresh ideas.

Agreeing that the panel plan recommended by the American Medical Association committee is the most feasible for use and the least undesirable, I doubt if good men in sufficient numbers could be found to serve as referees, to check up the work of the medical profession on points of judgment, inability for work, inadvisability of working, etc. I cannot conceive of men capable of passing those nice judgments, men whose intelligence and integrity the profession could respect, belittling themselves to the point of resigning practices to take up work of this class for the benefit of an employer who paid them a clerk's salary. Men of sufficient caliber to be capable of such work would invariably be too big to need it and too free to want it, while men willing to accept the jobs would invariably be of too small caliber to be of trustworthy judgment, because our territory differs from that of England and the European countries. In England men could accept the act and work under it or they could starve, for there was no other place to work. In the United States, for many years to come, men unwilling to empanel have the option of leaving the industrial centers to work in country communities where only a negligible proportion of the population would fall under insurance classification. Good men could feel confident of doing well in choosing to emulate Aesop's hungry wolf. On the other hand, mediocre men who had been unable to build up satisfactory practices in country territories could come to the industrial centers, empanel, and be granted a regular amount of work and three meals a day, to their own betterment and to the detriment of the insurance workings.

While these insurance plans were being evolved in Europe, little was being done in the way of preventive medicine.

Had our present-day knowledge of public health and sanitation been available and in general effective use, there is question that paternalistic governments would ever have attempted so fantastic a scheme as that of acting as financial fathers to their entire population.

The trend of opinion among American writers is that health insurance is inevitably coming and that we should adjust our affairs to it by entering now into petty bickerings and bargainings over the details of its arrangement. If it were a proved blessing I should agree with this view, even though it reduced medical men to the class of salaried workers and members of a trade union; but it is not proved. None of the European plans has shown a greater humanitarian or economic improvement than could very probably be attained by the employment of the sanitary methods and instruction with which present-day knowledge is enabling them to handle their armies, were these methods applied to civilian population, accompanied by government money and government compulsion in amounts equivalent to those which have been expended annually on the older idea.

I should like to see the Council on Health and Public Instruction of the American Medical Association and the committees of all state societies offer programs as a substitute for social insurance activities, and work in such fashion that laymen, the press and our legislative bodies understood the reasons therefor. I believe that all would have great cause to be satisfied with the increased economic output as compared with the results of the older method which has been heralded as new.

W. D. CHAPMAN, M.D., Silvis, Ill.

Mouth Sepsis

To the Editor:—Considerable attention has been bestowed on oral sepsis as an essential etiologic factor in systemic infections, and there is reliable scientific evidence in support of the tooth-root theory of this large class of diseases. The fact that chronic septic foci in teeth and elsewhere are exceedingly difficult to recognize in the majority of cases is undoubted. It is particularly instances of periapical infection or abscess that offer the greatest difficulty in this respect. Here, even a Roentgen examination, which should always be made by an expert, may fail to render reliable aid.

Daland states that the diagnosis of mouth sepsis should be made by a dentist who is specially trained for this, in which opinion I concur. The physician, however, who encounters a case of systemic infection in which the teeth are suspected should refer the patient to a competent nose and throat specialist with a view to eliminating all foci other than those which may be present in the mouth before invoking the services of the specially trained dentist. It sometimes happens that multiple foci are discoverable, in as many different organs, as the teeth, tonsils and sinuses.

Successful treatment of secondary systemic infection demands, first and foremost, the removal of the septic focus or foci on which they depend. Before reducing the masticating surface of a particular patient, however, the evidences of an existing necessity for so doing should be as clear and convincing as possible. An attempt by a competent dentist should be made to heal the morbid lesions in and about the tooth roots, since some of these are amenable to expert management, before ordering the extraction of the teeth.

Within the past six months a number of dentists have informed me that countless teeth are being removed without justification, on the advice of physicians, usually following a Roentgen examination (by amateurs in many instances). In well authenticated cases in which one or two teeth were the seat of peripheral infection, physicians have gone so far as to give emphatic directions to the effect that all of the remaining teeth be extracted. For example, one of Philadelphia's best known specialists in extraction was requested by a physician to pull out all of a certain patient's teeth—twenty—but he courteously, though firmly, declined to do so.

It seems to me that the rapidly growing custom of sacrificing teeth, many of which are merely suspected of being septic, cannot fail to arouse the most ardent activity of dentists in opposition thereto, and must prove the ultimate chagrin of the medical profession. It would appear that an amazingly low estimate is being placed on the value of human teeth by an increasing number of physicians, who should appreciate the importance of a good masticating apparatus to the digestive function—to the maintenance of health.

I do not mean to disparage the significance of these latent chronic septic foci as a cause of secondary systemic infections or to depreciate investigations in this, comparatively speaking, new field of endeavor. The object of this letter is to utter a word of warning with a view to lessening what I believe to be an unwarrantable present-day sacrifice of the masticating surface, and to spare the medical profession the adverse criticism of the future, by a broader conception proper to the subject of oral sepsis and its management in the present.

J. M. ANDERS, M.D., Philadelphia.

1605 Walnut Street.

Request for Names of Hospitals Facing Public Parks

To the Editor:—I would appreciate the receipt from readers of The Journal of the names and addresses of hospitals facing public parks. I wish the information to present to our city council, which is considering an ordinance prohibiting the building of a hospital within 200 feet of a public park.

M. M. Enos, M.D., Delger Building, Oakland, Calif.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ELIMINATION OF DIPHTHERIA BACILLI IN DISCHARGING EAR

To the Editor:—I am writing to know if you may be able to suggest anything relative to the subjoined case:

P. E., boy, aged about 2½ years, contracted scarlet fever, which ran the usual course. At no time was there an unusual sore throat, and there was never any membrane of the tonsil. The small amount of throat trouble cleared up in a few days.

About the second week of the child's illness the mother, who was attending him and doing her work, developed diphtheria. Ten thousand units of antitoxin were used on the mother and 1,000 on the child as a preventive, and a trained nurse was employed. There was no reaction to the antitoxin in the child. The mother made an uninterrupted recovery. Shortly after the mother had contracted diphtheria, the child developed a discharging ear. When the time came for the lifting of the quarantine a culture was made from the discharge of the child's ear and the diphtheria bacillus was discovered. The culture from the mother's throat was negative. Repeated cultures from the child's ear have shown the germ to be present, and finally a laboratory test was made with the guinea-pig to see if the germs were virulent. The pig died in thirty-six hours and the diphtheria bacillus was found in the pig.

As stated before, the child is apparently well otherwise and is regaining his strength and gaining in flesh. What am I going to do to get rid of this germ? Everything that I have used has been of no avail, and I have not found anything in my available literature to help me.

W. B. Wallace, M.D., Detroit.

Answer.—This case emphasizes the necessity of making cultures from all discharging ears, since virulent diphtheria bacilli are found in the ears much more often than is generally supposed. The failure to get rid of the bacilli is probably due to local conditions which prevent antiseptic or germicidal agents from reaching the focus of the bacilli. Examination of the ear should determine whether the drainage is free and whether the perforation in the drum head is too small or so situated that free drainage is not secured. Any such unfavorable conditions should be corrected by the aurist. As in the nose and throat, so also in the ear, persistent carriage of diphtheria bacilli is usually dependent on some local condition which must be corrected to facilitate the elimination of the bacilli.

HYDRORRHEA GRAVIDARUM

To the Editor:—A woman, aged 32, secundipara, who had a miscarriage about six months ago, whose present temperature is normal, the pulse 68, and who has had no menstruation since Oct. 5, 1916, while going about her housework, Jan. 12, 1917, passed a quantity of fluid which she believed to be a rupture of the "bag of waters." For about two hours, she experienced sharp pains in the lower abdomen of the nature of labor pains. January 13, I made bimanual examination and found the uterus enlarged to about the size of a three months' pregnancy, but the organ was hard, like a normal uterus. The pains have ceased entirely. There has at no time been any sign of hemorrhage. Could this be hydrorrhea gravidarum? What is the proper method of procedure on the supposition of pregnancy? I have maintained that curettage would be proper. Please advise. Would you not expect to find the uterus soft and patulous if this were a pregnancy? Please do not publish signature. F. S. D.

Answer.—The escape of fluid from the urogenital tract during pregnancy may be due to incontinence of urine, hydrorrhea decidualis or hydrorrhea amnialis. In this case it is possible that the cause is a hydrorrhea decidualis; that is, a collection of fluid is formed between the decidua vera and the egg, perhaps as a decidual cyst, which eventually is discharged through the cervical canal. The hydrorrhea amnialis, due to rupture of the membranes, probably high up in the uterus, is generally attended with slight bleeding. The firm consistency of the uterus found on examination was probably due to its contraction at the time of the examination. Whatever the cause of the discharge, the proper treatment is prophylactic treatment for abortion, that is, rest in bed and, if necessary, opiates. The chance for the continuance of gestation is better in hydrorrhea decidualis, although even if the discharge is from the liquor amnii the rent in the membrane may close and pregnancy may continue.

CERTIFIED MILK

To the Editor:—Please advise me as to the requirements necessary to establish a certified milk business. I particularly desire to know whether a local certified milk organization would have to be connected with another certified milk organization, or would have to get permission to use the trademark of "certified milk."

W. G. Bain, M.D., Springfield, Ill.

Answer.—To establish a certified milk business, a dairyman must be willing to cooperate with a medical milk commission and fulfil its specifications. The local medical milk commission need not be connected with any other certified milk organization. It would be advisable, however, to limit the term "certified milk" to milk produced in accordance with the requirements of the American Association of Medical Milk Commissions. These requirements may be obtained by consulting the annual reports of the association, and also Public Health Report 85, published May 1, 1912. The secretary of the American Association of Medical Milk Commissions is Otto P. Geier, M.D., Ortiz Building, Cincinnati.

SUBSTANCES INTERFERING WITH REACTION FOR SUGAR

To the Editor:—What substance or substances in the urine which fail to reduce Fehling's solution are fermented by yeast? I recently examined the urine of a supposed diabetic; Fehling's test was negative; acetone and diacetic acid were present in great excess, and the fermentation test showed 1.6 per cent. of sugar (if sugar it was). That the Fehling's solution had not deteriorated was shown by the fact that on the same day it reacted promptly to a specimen shown by the fermentation test to contain 1.2 per cent. of sugar. H. B.

Answer.—For practical purposes there is no substance in the urine fermented by yeast that does not reduce Fehling's solution, provided proper technic is employed. The reducing action of glucose, or other sugars, is diminished by strong alkali. Furthermore, the urine contains some compounds which interfere with the detection of glucose with strongly alkaline solutions. In addition, urine contains certain substances which prohibit the immediate precipitation of the cuprous hydroxid or oxid. Care must be exercised that the concentration of the alkaline cupric tartrate and the sugar is relatively low.

CHVOSTEK'S SIGN

To the Editor:—In The Journal, Jan. 13, 1917, p. 157, appears an abstract on the facialis phenomenon or Chvostek's sign. Will you kindly inform me how to elicit this sign?

Edwin A. Tufts, M.D., Arkansas City, Kan.

Answer.—Chvostek's sign is a peculiar excitability of the muscles of the face so that spasms are produced if the trunks of the facial nerve are lightly percussed. This occurs particularly in tetany, occurring in this condition even if the skin is lightly stroked.

Food Requirement and Food Consumption.—The discrepancies which are so frequently to be observed between food requirement and food consumption may be explained as due in part to present lack of adjustment to recent and enormous changes in environment and human activities and in the nature of foods. It seems quite possible that adaptation of diet to the activities of the organism, and other important hygienic measures, may come about, not simply through the slowly accomplished downfall of degenerate classes and nations, which history has so often shown us—for neither the rich fruits of shrewd business capacity nor the activities of the altruistic can ultimately shelter physical degeneration—but through the further discovery of the principles of scientific management of the human organism, and through the apprehension of these by the enlightened classes and the consequent practice of them by the world's population.—Minna C. Denton, *Scientific Monthly*, December, 1916.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CONNECTICUT: Regular: New Haven, March 13-14. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven.

CONNECTICUT: Homeo.: New Haven, March 13. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

CONNECTICUT: Eclectic: New Haven, March 6. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

ILLINOIS: Chicago, Feb. 21-23. Sec., Dr. C. St. Clair Drake, Capitol Bldg., Springfield.

MAINE: Portland, March 13-14. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, March 13-15. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MISSOURI: St. Louis, March 26-28. Sec., Dr. J. A. B. Adcock, 325 E. High St., Jefferson City.

New York June Report

Mr. H. H. Horner, Chief, Examinations Division of the New York State Board of Medical Examiners, reports the written examination held at Albany, Buffalo, New York and Syracuse, June 27-30, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 366, of whom 302 passed, including 7 osteopaths, and 64 failed, including 6 osteopaths. The following colleges were represented:

College	PASSED	Year Grad.	Total No. Licensed
Georgetown University		(1916)	1
George Washington University		(1911)	1
Northwestern University		(1896)	1
College of Physicians and Surgeons, Baltimore		(1913) (1914)	2
Johns Hopkins University		(1911) (1912) (1916,2)	4
University of Maryland		(1914)	1
Boston University		(1916)	2
Harvard University		(1915) (1916,7)	8
Albany Medical College		(1915) (1916,31)	32
Columbia University		(1912) (1915,6) (1916,21)	28
Cornell University		(1916)	16
Fordham University		(1915) (1916,13)	14
Long Island College Hospital		(1916)	69
New York Homeopathic Medical College and Flower Hospital		(1914) (1915,4) (1916,12)	17
New York Medical College and Hospital for Women		(1916)	6
Syracuse University		(1913) (1916,17)	18
University and Bellevue Hospital Medical College		(1914) (1915,3) (1916,23)	27
University of Buffalo		(1916)	31
Eclectic Medical College		(1916)	1
Medical College of Ohio		(1900)	1
Jefferson Med. College of Philadelphia		(1914) (1915) (1916,6)	8
Medico-Chirurgical College of Philadelphia		(1916)	1
Vanderbilt University		(1914)	1
University of Texas		(1915)	1
University of Vermont		(1915)	1
Medical College of Virginia		(1915) (1916)	2
University of Naples		(1894)	1
	FAILED		
University of Alabama		(1915)	1
Rush Medical College		(1899) (1916)	2
University of Louisville		(1912)	1
College of Physicians and Surgeons, Baltimore		(1914)	1
Johns Hopkins University		(1916)	1
University of Maryland		(1916)	2
Harvard University		(1916)	1
Tufts College		(1915)	1
Albany Medical College		(1910) (1915) (1916)	3
Columbia University		(1914) (1915) (1916,2)	4
Fordham University		(1912) (1913) (1914) (1916,4)	7
Long Island College Hospital		(1916)	1
New York Homeopathic Medical College and Flower Hospital		(1913) (1914) (1915,2) (1916,6)	10
New York Medical College and Hospital for Women		(1916)	5
University and Bellevue Hospital Medical College		(1916)	2
University of Buffalo		(1916)	2
Jefferson Medical College of Philadelphia		(1902) (1915)	2
Medico-Chirurgical College of Philadelphia		(1915)	1
Woman's Medical College of Pennsylvania		(1915) (1916)	2
Medical College of Virginia		(1914) (1916)	2
Queen's University		(1915)	1
McGill University		(1900)	1
University of Brussels		(1913)	1
National University, Athens		(1887)	1
University of Catania, Italy		(1912)	1
University of Naples		(1896)	1
Medico-Chirurgical Institute, Stockholm		(1879)	1

Missouri September Report

Dr. J. A. B. Adcock, secretary of the Missouri State Board of Health, reports the oral and written examination held at Kansas City, Sept. 18-19, 1916. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 22, of whom 18 passed and 4 failed. Four candidates were granted reregistration licenses by examination. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Howard University		(1915)	82
Georgia College of Eclectic Medicine and Surgery		(1914)	83
Loyola University		(1916)	78
Rush Medical College		(1916)	82
University of Illinois		(1916)	82
Tulane University of Louisiana		(1916)	84
Harvard University		(1916)	86
Ensworth Medical College		(1909)	79
Kansas City Hahnemann Med. Coll.		(1907)	77
Kansas City Medical College		(1899)	75
National University of Arts and Sciences		(1916) 75,	77
John A. Creighton Medical College		(1916)	75
New York Homeo. Med. Coll. and Flower Hosp.		(1910)	85
Western Reserve University		(1914)	86
Jefferson Medical College of Philadelphia		(1916)	91
Meharry Medical College		(1916)	80
University of Nashville		(1901)	88
	FAILED		
Chicago College of Medicine and Surgery		(1914) 73; (1916)	*
National University of Arts and Sciences		(1916)	74
St. Louis College of Phys. and Surgs.		(1910)	71

* No grade given.

California October Report

Dr. Charles B. Pinkham, secretary of the Board of Medical Examiners of the State of California, reports the oral and written examination held at Los Angeles, Oct. 2-6, 1916. The total number of subjects examined in was 9; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 51, of whom 37 passed, including 12 osteopaths, and 14 failed, including 8 osteopaths. Thirty-nine candidates were licensed through reciprocity. Four candidates were granted drugless practitioner's license and 3 chiropodist's license. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
California Eclectic Medical College		(1916) 78.4,	83.2
College of Medical Evangelists		(1916) 81.9,	84.2
College of Physicians and Surgeons, Los Angeles		(1915) 91.4; (1916) 81.8, 82.1, 87.9, 90.4, 94.	
Hahnemann Medical College of the Pacific		(1916)	86.4
University of Colorado		(1914)	75.7
George Washington University		(1916)	82.4
Rush Medical College		(1915) 90.1; (1916)	89.9
Harvard University		(1912)	96.3
University of Michigan, Homeopathic Medical School		(1912)	84
Eclectic Medical College		(1913) 91.4; (1916)	81.3
University of Oregon		(1916)	88
Jefferson Medical College of Philadelphia		(1916)	89
University of Virginia		(1907)	93
University of Heidelberg, Germany		(1898)	84.9
National School of Medicine, Mexico		(1899)	78.3
McGill University		(1912)	93
	FAILED		
California Eclectic Medical College		(1915)	73.1
Hahnemann Med. Coll. of the Pacific		(1916)	70.3
St. Louis College of Physicians and Surgeons		(1907)	53.6
John A. Creighton Medical College		(1913)	63.3
Laval University		(1911)	25.7
Kyoto Imperial University, Japan		(1910)	61.3

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
University of Alabama		(1911)	Arizona
College of Physicians and Surgeons, Los Angeles		(1903)	Arizona
Denver College of Physicians and Surgeons		(1909)	Colorado
Yale University		(1911)	Mass.
Georgetown University		(1912)	New York
Southern Medical College		(1891)	Texas
Chicago Homeopathic Medical College		(1888)	Missouri
Coll. of Phys. and Surgs., Chicago		(1890) Colorado; (1907)	Illinois
Northwestern University		(1901)	Illinois
Rush Medical College		(1889) Iowa; (1896) (1899) Utah; (1901) Minnesota; (1900) (1911) (1914) (1915)	Illinois
Medical College of Indiana		(1882)	Indiana
Keokuk Medical College, College of Physicians and Surgeons		(1901)	S. Dakota
College of Physicians and Surgeons, Kansas City		(1897)	Wisconsin
University of Louisville		(1910)	Michigan
Johns Hopkins University		(1910)	Washington
Harvard University		(1884)	Penna.
University of Michigan, Homeo. Med. School		(1907)	Penna.
Eclectic Medical University		(1912)	Arkansas
Marion-Sims-Beaumont Medical College		(1902)	Arizona
Columbia University		(1891)	Washington
N. Y. Homeopathic Med. College and Flower Hospital		(1913)	New York
University of Buffalo		(1912)	New York
Eclectic Medical College		(1889) Missouri; (1894)	Kentucky
Medical College of Ohio		(1882)	Wisconsin
Jefferson Medical College of Philadelphia		(1913)	Washington
University of Pennsylvania		(1873) Michigan; (1914)	Penna.
University of Pittsburgh		(1909)	Penna.
University of Ghent, Belgium		(1888)	New Jersey
McGill University		(1908)	Idaho

Book Notices

On Modern Methods of Treating Fractures. By Ernest W. Hey Groves, M.S., M.D., B.Sc., Surgeon to the Bristol General Hospital. Cloth. Price, $2.75 net. Pp. 286, with 136 illustrations. New York: William Wood & Co., 1916.

In this small volume the author tries to choose that which he considers best in the modern developments of the treatment of fractures, and substantiates it wherever possible by extensive experimental work. He assails separately the principles of the "classical school," which aims at setting the bone, prolonged immobilization and fixation of the neighboring joints, leaving the soft parts to take care of themselves. In their stead he advocates the intelligent employment of the modified methods of Bardenhauer on continuous extension of Lucas-Championnière on early massage and motion, and of Lane on open operation. Causes for bad results in the various types of fractures treated by different methods are discussed. A special chapter is devoted to the various types of external extension appliances, as Buck's extension, Bardenhauer's extension methods, the Balkan splint, Hodgen's splint, and the crutch splint of Borchgrevink for fractures of the humerus. Mechanical modifications of these external methods are detailed, as the Steinmann nail extension, and double transfixion apparatus of Lambert and Groves. About 100 animal experiments are given, showing the relative values of a great many operative methods of fixation of the fragments, as plates and screws, plates and cotter pins, and intramedullary pegs of bone, living and dead, ivory, horn, metallic magnesium and steel. There is considerable comment on bone regeneration and the healing of comminuted fractures. The work is concluded with a chapter on the operative treatment of special fractures, giving the author's results.

Diseases of Occupation and Vocational Hygiene. Edited by George M. Kober, M.D., LL.D., and William C. Hanson, M.D. Cloth. Price, $8 net. Pp. 918, with illustrations. Philadelphia: P. Blakiston's Son & Co., 1916.

This work deals with a multitude of subjects which should be of vital interest to a variety of people, the physician, the employer, the worker, and last but by no means least, the legislator. For the physician, especially, it contains information concerning the diseases which are caused or aggravated by the different kinds of employment. Although the various articles are from the pens of different writers, they show a commendable tendency to stick closely to known facts. The chapter on "Cancer and Occupation" is an example of this. The more important theories of the etiology of cancer are discussed in an unbiased manner.

The conclusions reached may be briefly summarized as follows: Concerning a specific infection, "Repeated attempts to isolate such an agent from mammalian tumors have invariably failed"; the question of contagion "has never been demonstrated"; concerning heredity "while the data collected up to the present time from animal experimentation are insufficient to serve as a basis for any sweeping conclusions concerning human inheritance, we are of the opinion that the results already obtained are sufficient to call for a reconsideration of the subject of heredity with reference to cancer"; concerning injury, "the principal cause would appear to lie in the peculiarity of the individual, for trauma is of so great frequency that it cannot in any sense be regarded as the specific cause of any type of tumor"; in regard to chronic inflammation as a basis for cancer, "there are agents to which all individuals are exposed to a greater or less degree that are mildly injurious. The undue or prolonged exposure of the skin to such agents evidently has a tendency to bring on a premature senility of its tissues, especially in certain individuals. Since, however, most of the tumors of this type are of comparatively slight malignancy such influences are not of first importance." "No very marked preponderance of cancer in any of the more usual occupations is shown by Newsholme's Statistics." The effect of Roentgen ray in this connection is recognized but "there are as yet no reported cases of carcinoma arising from radium burns." However, the similarity between Roentgen ray and radium should warn against the indiscriminate or careless use of this agent. It is perfectly evident from the above that the real cause of cancer is not yet known, nor can cancer be directly connected in a causal way to any particular occupation.

The work was written for laymen as well as physicians and many employers might derive much profit in the way of better and more efficient work by their employees if more attention were given to better hygienic conditions in the shop, factory, etc., but there seems to be few of them who are longheaded enough to see that far. Not the least among those who might derive much benefit from the careful study of this work are legislators. In this day of legislative mania, when quantity seems to be a greater desideratum than quality, much half baked and even unbaked legislation is being passed, particularly along the line of so-called health laws.

Disturbances of the Heart. Discussion of the Treatment of the Heart in Its Various Disorders, with a Chapter on Blood Pressure. By Oliver T. Osborne, A.M., M.D., Professor of Therapeutics, Yale Medical School. Second Edition. Cloth. Price, 75 cents. Pp. 269. Chicago: The Journal of the American Medical Association, 1916.

Safe and sane guides to therapeusis are particularly needed in diseases of the heart and blood vessels, which occur frequently and in which much can be accomplished for the patient by rational measures. Osborne presents a concise description of the methods of treatment indicated in these diseases. In the chapters on blood pressure, proportionately more full than those dealing with other cardiac disturbances, the methods of determining pressures are discussed, together with the significance of high and low pressures, as related to the heart itself and as indexes of the presence of concomitant conditions. Chapters on pericarditis, myocardial disturbances, endocarditis and chronic valvular disease follow. Heart disease in children and in pregnancy are discussed, as are also the problems of therapy arising in cardiorenal disease. Abnormalities of rhythm and rate are considered in the light of recent studies with the electrocardiograph. The section on the indications for therapy in angina pectoris and heart block are brief but to the point. The importance of chronic infections as a cause of the pain in pseudo-angina might profitably have received more emphasis. As a concise statement of what to do and what can be accomplished in the treatment of disturbances of the heart and blood vessels, this manual can be heartily recommended to all practitioners of medicine.

Manual of the Medical Department, United States Army. Cloth. Pp. 395. War Department, Document No. 504. Washington: Government Printing Office, 1916.

This manual, prepared under the supervision of a board consisting of Lieut.-Col. Henry C. Fisher and Majors Elbert E. Persons and Reuben W. Miller, Medical Corps, presents many features which offer opportunities for efficiency not found in previous manuals. As it now appears, the manual is a complete treatise on medicomilitary administration, so arranged that even the neophyte may read and understand it. Instead of including all the information bearing on military administration which is to be found in the army regulations, general orders and service manuals, which should be in the hands of all medical officers, the manual contains an appendix which refers, by subject headings, to the more important orders containing matters of interest to medical officers. If the manual and appendix were printed on loose leaves and assembled after the method of the U. S. Navy Regulations, it would be possible to print changes in regulations on loose leaves which could be inserted. This would avoid the haphazard method, at present necessary, of clipping orders and circulars and pasting them in the manual, to the eventual detriment of the binding by reason of bulk. Many sections of the manual have been rewritten, new articles have been added, and all matter has been brought up to date. One aid to the student of the manual is the introduction of subject running heads on the right hand pages.

More Hospitals.—The greatest need of practical medicine today is more and better equipped hospitals.—V. C. Vaughan, M.D., *Science*, Dec. 8, 1916.

Social Medicine, Medical Economics and Miscellany

Fatal Case of Periodic Vomiting with Acetonemia in a Child

A case reported recently by P. Busacchi in a boy of 4 had all the features of this syndrome except that the attacks came on without any vomiting. The prostration each time was severe, with coma and fever, and the acetone odor of the breath was intense while the urine contained notable amounts. Another child had repeated attacks, but only one was known to be accompanied by vomiting. He suggests, therefore, that the syndrome had better be called hemo-acidosis of the cyclic or acyclic type, with convulsions or depression as the case may be. In a recent case a boy of 6, previously robust, was taken suddenly with severe vomiting and high fever, and he became unconscious with erythema of the face and trunk, convulsions and coma, dying within twenty-four hours. The odor of acetone was strong in the breath and urine throughout, and the Kernig sign was pronounced. Nothing was found in the vomit or stools to suggest poisoning from without. The necropsy findings excluded meningitis and other probable causes, the syndrome being thus evidently the work of hemo-acidosis of the convulsion type. The thymus and lymph glands were enlarged. Busacchi knows of only eleven cases on record with a fatal outcome, and only a few had necropsy control. His little patient had never shown signs of a nervous predisposition, and nothing was found to indicate acute or chronic indigestion or appendicitis; but a sister of 9 had presented two similar severe attacks. The mother had died at 39. She had been subject to headache and arthralgia. In connection with a possible gouty basis for the trouble, Busacchi relates that the urine in the first case mentioned above contained a large number of uric acid crystals during the days following an attack. Comby regards the syndrome as an equivalent for the manifestations of the exudative diathesis. In Busacchi's fatal case the viscera had evidently suffered recently and severely from the acidosis, the changes in the kidneys being enough to explain the fatal outcome. In his report, which appeared in the *Rivista Critica di Clinica Medica*, 1916, **17,** 473, he discusses the pathogenesis and reviews the literature on the subject. The fatty metamorphosis found in the liver is, he thinks, merely secondary, as the children always seemed well and strong outside of the attacks.

Nature of Gout

R. Bass and R. Herzberg have recently published some researches in this line, according to a summary of their work in the *Norsk Magazin for Lægevidenskaben*. They recall that the variations in the output of uric acid in gout—"uric arthritis"—may depend on the secreting power of the kidneys, so that it is necessary to determine the uric acid content of the blood in estimating the case. But this examination of the blood generally does not take place until the attack of gout is fully developed. By that time the diet has already been changed in order to arrest the attack. This change to a purin-free diet rapidly reduces the uric acid content of the blood, whether or not there has been a preceding attack of gout. In order to study the influence of an attack on the uric acid content of the blood, it would therefore be necessary to refrain from reducing the purin elements of the diet during and after the attack, or else the conditions would have to be studied in a patient having an attack on a strictly purin-free diet. The influence of drugs must also be excluded. Three patients were put on a purin-free diet during an attack, and the uric acid in 100 c.c. of blood dropped from 7.2 to 5, from 5.5 to 4, and from 4.3 to 2.7 mg. In two others who had been on a purin-free diet before the attack, the uric acid in the blood kept at exactly the same figure during the attack, and when reexamined one and three weeks later, namely, 5 and 3.2 mg. Other patients were on a purin-containing diet both during and after the attack, and these had approximately the same figures for the uricacidemia during and after the attack; in only one case was there a difference amounting to 0.4 mg. Spontaneous attacks of gout can thus develop and subside without modifying the uric acid content of the blood.

Experience has shown, however, that ingestion of large amounts of purin-producing foods can bring on an attack of gout at the same time that the uric acid content of the blood increases. In order to ascertain whether it is the uric acid which works on the joints, Bass and Herzberg injected intravenously considerable amounts of sodium urate, up to 1.8 gm. of uric acid in 100 c.c. of fluid. But this never induced symptoms in the joints, even in gouty persons, who were extremely subject to attacks, and even when the uricemia rose to 10 mg. It is probably therefore not the uric acid as such, but other intermediate purin substances which elicit the pains in the joints, such as the nucleosids or purin bases. The article of Bass and Herzberg appeared in the *Deutsches Archiv für klinische Medicin*, 1916, **119,** 482, and concludes with the deduction from the foregoing research that uricacidemia cannot be regarded as the specific feature of gout. Merely the distribution of the uric acid in the body seems to be the characteristic of gout. F. Müller calls uric acid an "arthotropic substance," but the uric acid content of the blood and of the fluid in the joints proved to be approximately the same in a large number of tests, including some on the cadaver, the joints punctured after death. None of these subjects had had attacks of gout; but in two patients who had succumbed to uremia, uric acid was found in the joint fluid in a concentration of 18.5 and 20.8 mg., while the blood content was only 10 and 8.2 mg. There thus exists in fact an abnormal attraction for uric acid in the joints in gout which does not occur in other affections. Persons with gout have evidently an exceptionally high capacity for taking up uric acid in the tissues. With intravenous injection of uric acid, the blood content keeps at the same level so long as the kidneys eleminate it properly. But in the gouty the uricacidemia is lower, nothwithstanding reduced elimination in the urine. More uric acid, therefore, must be taken up by the tissues in the gouty than in other patients.

Pregnancy Toxicoses

Our Norwegian exchange brings an abstract of an article on his subject by L. Seitz in the *Therapeutische Monatshefte*, 1916, p. 173. Seitz advises in treatment of eclampsia a combination of Stroganoff's prophylactic method and venesection to relieve the high blood pressure and get rid of some of the toxins in the blood. These measures are supplemented with subcutaneous infusion of Ringer's solution, and the patient is made to drink freely of lemonade. The childbirth must be hastened as much as possible with gentle means, avoiding all severe operative intervention. (The Stroganoff method was described in THE JOURNAL, Feb. 12, 1916, p. 530.) With pregnancy nephritis the retention of salt and water is best combated by bed rest, and this must be absolutely enforced. The kidneys are spared further by avoiding intake of salt, keeping to milk alone. As a rule under these measures the nephritis subsides entirely, so that the pregnancy can go on to term. In only a very few cases is it found necessary to interrupt it. Generally speaking, the nephritis which develops acutely with sudden and pronounced edema and albuminuria is the most dangerous. Seitz combats pregnancy dermatoses with a milk-vegetable diet, bed rest, and subcutaneous injection of Ringer's solution. If this does not cure, he tries injection of horse serum or 20 c.c. of serum from a normal pregnant woman. Rest and dieting are the main things. An essential element in the treatment of the incoercible vomiting of pregnancy is the removal of the patient from her wonted surroundings. The first one, two or three days after she reaches the clinic she is allowed nothing whatever by the mouth, but saline is given by the rectum by the drip method, eventually with addition of potassium bromid. R. Freund has also found injection of serum gives good results. Only a few cases prove intractable. These refractory cases are more of a toxic than of a nervous character, and the uterus will have to be evacuated. Dryness of the tongue, offensive breath, bad pulse, albuminuria and especially a rise in temperature call for the arrest of the pregnancy without delay.

Medicolegal

Validity of Regulations Bearing on Transportation of Milk into City

(City of Chicago vs. C. & N. W. Ry. Co. (Ill.), 113 N. E. R. 849)

The Supreme Court of Illinois reverses a judgment imposing a fine of $100 on the defendant for delivering in the city of Chicago, Aug. 21, 1914, milk at a temperature of from 67 to 76 or higher than 55 F., the milk having been brought to the city in baggage cars having no refrigerating facilities, the trip taking in the neighborhood of two hours. The city charged violation of an ordinance covering in detail practically all matters regarding the supervision of the production, handling and delivery of milk to be sold within the city—not only its treatment in the city, but on the farm from whence it is shipped, including the straining and cooling of the milk immediately after the cows are milked and the temperature at which it shall be kept from that time until it is delivered to the consumers in Chicago. The court says that counsel for the defendant admitted that a municipality has the power to regulate what kind of milk shall be sold within its limits, and that such rules and regulations may indirectly affect the production of the milk on the farms outside the city limits, and that it may thus apply regulations that will, in effect, require milk to be cooled immediately after it is taken from the cow and to be kept cool until transported to the city for delivery. This is undoubtedly the law. This court, in construing certain provisions of this ordinance with reference to the regulations for pasteurizing milk, upheld the validity of the ordinance in that respect, and, in effect, held regulations such as are before the court in this case valid, provided they are reasonable and are adapted to the objects sought to be attained. The court thinks that, under any fair construction, the ordinance was intended to apply to common carriers in the transportation of milk from the country to the city; otherwise it would be ineffective. The object sought to be obtained would be absolutely defeated if common carriers, in the transportation of milk from the country to the city, were not required to keep it cool in transit. The court does not agree with the contention that, as common carriers ordinarily must accept all freight tendered, therefore they would not be justified in refusing to receive cans of milk even though they were not within the limitations of temperature required by this ordinance. The common carrier should not be permitted to be the one agency of those handling milk between the time it is milked and the time it reaches the consumer to defeat the purposes of a reasonable health ordinance on that subject. But it was contended that the ordinance here in question, if intended to apply to common carriers, was invalid, being unreasonable in its method of regulation; that other provisions of the ordinance require that cans of milk be sealed before they are shipped, and that the seals shall remain unbroken during transportation by the carrier, and that the carrier, therefore, cannot ascertain the temperature of the milk at the time it is shipped. And the court suggests that, on the record before it, it must be held that the provision here in question of this ordinance, so far as it applies to common carriers, is unreasonable and void, though it suggests further that, after the case is sent back to the trial court, if it can be, more proof be presented to show that the ordinance is reasonable on all the questions involved. Notwithstanding divers scientific theories, on subjects of this nature the courts usually defer to the determination and decisions of the proper authorities as to the basis of police regulations, unless such basis is manifestly erroneous. The court realizes how important the question under consideration is to the health of the people of Chicago and the state at large, and it has no hesitation in reaffirming the rules heretofore laid down by it with reference to the right of the authorities of the city of Chicago to make all proper and reasonable regulations with reference to the care, transportation, sale and delivery of milk in order to protect and promote the health of the people—especially the children—of that city.

Guarding Against Typhoid Fever — May Require Blood Test of Milk Dealers

(People ex rel. Schulz vs. Hamilton et al. (N. Y.), 161 N. Y. Supp. 425)

The Supreme Court of New York, special term, Monroe County, per Justice Rodenbeck, denied an application for a writ of mandamus to the commissioner of public safety of the city of Rochester and others to compel the issuance of a license to the relator to sell milk, after he had refused to submit to a blood test to determine whether or not he had typhoid fever and was a carrier of typhoid germs. The court says that the condition of the public health of the city at the time with respect to typhoid fever was not abnormal, and still the requirement of a blood test as a condition for a license to sell milk and cream seemed to be a fair and reasonable precaution, to protect the public against any increase of typhoid. Milk is a peculiarly sensitive product, produced under conditions which, if not regulated and controlled, may carry and disseminate the germs of typhoid or other diseases and spread them in the community. It is the chief food of infants, and lies at the basis of their health and strength. It may be heated, sterilized or pasteurized; but even then contact with unclean utensils or unclean human beings may make it the carrier of disease germs. Unlike other articles of food, it cannot be washed and otherwise cleansed in the home. The impurities may be hidden from sight, and thus a sense of security engendered which may render it a still more serious menace to health. Under these conditions it would seem to impose no unreasonable hardship on a dealer in milk or cream to require him to submit to a blood test, to make sure that he has not had typhoid and is not a typhoid carrier. That typhoid fever is a contagious disease and may be transmitted by one afflicted with the disease is a matter of common knowledge, and the court will take notice of that fact without proof. The court will also take notice of the fact that an examination of a drop of blood will reveal whether or not the person from whom it has been taken has had typhoid. This may not be universally held by scientific men, or universally believed by the people; but, until science disproves the value of the test, it will be accepted by the courts as true. The imposition of this test with respect to this particular occupation, and the requirement of this and any other test in any other occupation which may affect the public health rests in the sound discretion of the state or local authorities in whom the discretion to pass on the subject has been vested. This rule does not infringe on the civil rights of the individual. Government has been instituted among men for their mutual protection, and no man has the right to make himself or his business a menace to the public health. It is important to the whole community that the supply of milk and cream should be kept clean, pure and wholesome, and should not be contaminated with impurities, or infected with disease; and it is the duty of the health authorities to see that this is accomplished by the establishment of such reasonable regulations as may be necessary to meet existing conditions or to ward off impending dangers to the public health; and in imposing a blood test as a condition to a license to sell milk and cream in the city, the commissioner of public safety and the health officer acted within the scope of their authority, and applicants for such a license should cooperate with the public authorities, and assist, rather than oppose, reasonable efforts to provide pure and wholesome milk and cream for the people of the city. The requirement of a blood test of an applicant for a license is just a step, and a small one, in the direction of the protection of the public health; but every reasonable effort made in this direction should be encouraged, so long as it does not unreasonably infringe on the rights of the individual. The court holds, too, that the health authorities of the city are not required to wait until an epidemic of typhoid has broken out before taking precautions against it, but in the exercise of a reasonable judgment may anticipate such a condition, and may and should make all reasonable efforts to perform the duty imposed on them by statute and to take all reasonable precautions to protect the public health before the emergency arises.

Society Proceedings

COMING MEETINGS

Am. Assn. of Pathologists and Bacteriologists, New York, April 6-7.
Missouri Valley Medical Society, Keokuk, Ia., March 22-23.
Western Roentgen Society, Hotel Sherman, Chicago, Feb. 16-17.

ANNUAL CONGRESS ON MEDICAL EDUCATION, PUBLIC HEALTH AND MEDICAL LICENSURE

THIRTEENTH ANNUAL CONFERENCE OF THE COUNCIL ON MEDICAL EDUCATION OF THE AMERICAN MEDICAL ASSOCIATION

Held in Chicago, Feb. 5, 1917

DR. ARTHUR DEAN BEVAN, Chicago, in the Chair

Progress of the Year in Medical Education

DR. N. P. COLWELL, Chicago: The requirement of two years of college work for admission to medical colleges is reasonable, and the action taken by the House of Delegates last June in making that standard a requisite for the Class A rating was not drastic. This is indicated by the fact that at that time fifty-one medical colleges and sixteen licensing boards had already adopted that standard. At present sixty-five medical schools and nineteen state licensing boards have adopted two years of college work as the minimum standard of preliminary education.

A clause in the recommendation adopted by the House of Delegates stated that the colleges of arts and sciences in which the two years of college work were to be obtained should be "approved by the Council on Medical Education." This made it the duty of the Council to prepare a list of approved colleges. The Council has secured lists of those approved by various standardizing agencies, such as the Association of American Universities, and the North-Central and Southern Associations of Colleges and Secondary Schools, and by leading universities.

The House of Delegates also instructed the Council to cooperate with other educational organizations in an endeavor to save one or two years of the student's time during the course of his preliminary or medical education. For the present session of the medical schools from which reports have been obtained, a large majority show increases in the enrolment of students in freshmen classes. Although the total number of medical schools has been reduced by over 40 per cent. in the last twelve years, the number of colleges having improved educational standards has been increased by over 95 per cent. The numbers of medical students and medical graduates from these high standard colleges have been increased in about the same proportion.

One of the most satisfactory accomplishments of the Council has been the development of the medical students' register, which was started in 1910. In that work, from the beginning, the Council has had the cooperation of a large majority of the medical schools, which have furnished intricate and detailed reports regarding the new students enrolled each session. In addition, the colleges have sent reports from the individual students, giving their educational histories up to the time they entered medical school.

Attention was called a year ago to clauses in the medical practice acts of the Canadian provinces of Ontario and Quebec discriminating against medical schools of the United States. Correspondence with officials in Ontario has resulted favorably, and the discriminatory clause has been stricken out. With the Province of Quebec, however, the practice act still requires that before a graduate of any medical school in the United States can secure registration in that province he must follow the last year of the medical course in one of the schools of medicine of Quebec.

A year ago attention was called to the lack of safeguards in the chartering of educational institutions in the various states. Correspondence has since been carried on with superintendents of public instruction, presidents of state universities, secretaries of state medical licensing boards and officers of state medical societies, calling attention to that need and urging the securing of better legislation. As the correspondence progressed, it was ascertained that any legislation regulating the chartering of educational institutions should contain the following provisions: (*a*) restrictions in the use by any person, organization or corporation of the terms "school," "academy," "college" and "university"; (*b*) educational standards which should be met by institutions seeking the right to grant degrees before a charter is issued; (*c*) revocation of the charter of any institution which is found to lack the needed equipment or teachers; which may be found to be using fraudulent methods, or which for other reasons is not living up to the standards fixed by the state; (*d*) a state board, commission or other body which would have in charge the regulation of such institutions as have been chartered, and (*e*) ample funds for effectively carrying out the provisions of the law.

The objection to medical cults is their lack of adequate education. Any one having to do with the treatment of human diseases needs to have a sufficiently thorough training to be able to recognize the disease he is attempting to treat; otherwise his treatment is unscientific and as liable to do harm as good. A training in the fundamental sciences is needed, no matter whether drugs are employed or not, and no matter what system or method of treatment may be used.

The educational standard adopted in all leading nations as the reasonable minimum standard for practitioners of the healing art includes: (*a*) a secondary school course equivalent to that of the better high schools of this country, and in addition the completion of one or two years of work in a college of liberal arts, including courses in physics, chemistry and biology; (*b*) a thorough medical training, provided by a four year course in a well equipped medical college, including two years in the laboratories of anatomy, physiology, bacteriology, pathology, pharmacology and physiologic chemistry, and two years in clinical instruction in dispensaries and hospitals, and (*c*) the practical experience obtained in a fifth year spent as an intern in a good hospital.

The Problem of Higher Degrees in Medicine

DR. HORACE D. ARNOLD, Dean, Harvard Graduate School of Medicine, Boston: Opportunities for advanced study and research have long been offered by medical schools, yet the problem of higher degrees in medicine has arisen only recently. Degrees for the recognition of advanced scholarship are sanctioned by our best universities, and help to establish and maintain high standards of scholarship. Medicine is undoubtedly a proper field of learning in which to grant advanced degrees.

The existing degrees of B.A. and B.S., M.A. and M.S. and Ph.D. are comparatively satisfactory. The curriculum of a professional school is on the same relative level as the collegiate course, in that it properly leads to a baccalaureate degree, e. g., LL.B., B.D. A bachelor who completes such a curriculum should receive a second baccalaureate degree rather than a master's degree or any other higher degree. Medicine is an exception to this rule, as the regular medical course leads to the degree of Doctor of Medicine, instead of Bachelor of Medicine. This custom has become so firmly established in practice that it must be regarded as permanent, and it is not practicable to change from M.D. to M.B. The problem of higher degrees in medicine is complicated, therefore, by the fact that the doctorate degree is conferred after a course properly leading to a bachelor's degree.

In some instances the degree of Doctor of Science, Sc.D., has been utilized, but this is undesirable, since that degree is used much more commonly as an honorary and not as an earned degree. The use of the Sc.D. degree with mention of the professional field, D.S.Med., D.S.Jur., D.S.Theol., D.S.Eng., has been suggested as the best way of recognizing advanced research in the various professions.

As an advanced degree with less exacting requirements, the Master of the Science of Medicine, M.S.Med., is suggested. The Master of Science without designation of field is conferred after the attainment of B.A., B.S. or an equiva-

lent degree, and, therefore, would not be satisfactory after the attainment of the M.D.

Professional study beyond that corresponding to a master's degree might lead to a practitioner's degree, types of which are found in the engineering profession, such as Civil Engineer and Mechanical Engineer. The call for such a degree in medicine is indicated by the recent efforts to establish suitable standards for specialists by the American College of Surgeons, the societies in ophthalmology and other societies of specialists.

DISCUSSION

DR. VICTOR C. VAUGHAN, Ann Arbor, Mich.: The multiplication of degrees is something that should be avoided so far as possible. There are already too many degrees. The Master's degree as a graduate degree in literary colleges is a joke. While, as a rule, it is not a disgrace, it is at least no honor to have it. With these postgraduate degrees there is always a tendency to keep the student in the school where he obtained his undergraduate work. Some years ago we tried to encourage the migration of students so that a student could spend one year in one college, another year in some other university, and so on. A man who has had four years as an undergraduate in a medical school, in getting his clinical work, should go to other medical schools, so as to come in contact with different men. Examinations are a necessary evil, and I do not see how we can get rid of them. They interfere with a man's originality and with his research work. They constantly loom up before him as a specter. The National Board of Medical Examiners has set a high standard, and the passing of its examination ought to be equivalent probably to the highest medical degree obtainable in this country. The board does not want ordinary students, but does want the six or eight best students in every class after they have had a hospital year.

HARRY PRATT JUDSON, President, University of Chicago: The multiplying of degrees will not help us much. A man should be known by what he has accomplished rather than by the degrees he has obtained. One man may be eminent in medicine and another in research work, yet both may hold the same degree; they are known by what they do rather than by the degree they hold. A simple solution of the problem would be to give the degree of Doctor of Philosophy. It does not matter whether a man is a specialist in mathematics or specialist in pathology; it is all the same so far as the degree goes.

DR. HORACE D. ARNOLD, Boston: The Council's chief object is to establish some means of standardizing the best medical men. I know of nothing more likely to raise the public estimate of the medical profession than to have it recognized by universities as on the same high plane as the arts and some of the sciences which would be the case if its eminent specialists were granted the degree of Doctor of Philosophy.

DR. ARTHUR DEAN BEVAN, Chicago: It is the function of universities to determine this matter, and the Council may give them the point of view of the medical profession. The Chair desires to appoint the following special committee to investigate and report on this subject: Dr. Horace D. Arnold, Boston, chairman; Dr. N. P. Colwell, Chicago, secretary; Dr. L. B. Wilson, Rochester, Minn.; Dr. Isadore Dyer, New Orleans; Dr. John M. Dodson, Chicago; Dr. William Pepper, Philadelphia; Dr. Victor C. Vaughan, Ann Arbor, Mich.; Dr. J. M. T. Finney, Baltimore; Dr. Edward Jackson, Denver, and Dr. James Ewing, New York.

Economy of Time in Preliminary and Medical Education

DR. ARTHUR DEAN BEVAN, Chicago: A study of conditions in Germany and England shows that in countries abroad a student goes from the secondary school direct to the medical department of the university, in Germany at the age of 19 and in England somewhere between 17 and 20. In this country the requirements of preliminary education have been gradually raised until the accepted American standard is two years of college work including the sciences preliminary to medical education. As a result, medical graduates, after completing their hospital intern year, are 28 years of age on the average, whereas in Germany and England the average is from 25 to 26 years.

It is not in the interests of national efficiency for us to graduate our men in medicine two years later than is done in England and Germany. Men at the younger age are more eager, more plastic, and have greater possibilities of a future than men graduating two, three or four years later. This points clearly to the desirability of reorganizing our scheme of education so as to save two or three years of the student's time.

A conclusion forced on me has been the little excuse for the four year college course that is sandwiched in between the high school and the university without definite aim or purpose. Nothing like this has developed in any other country. It has been demonstrated that two years of special technical training in sciences after leaving high school is sufficient for admission to the medical school. The investigation made shows that even with this saving of two years of time as compared with the full college course, the length of time required to complete the premedical and medical training is too great by at least two years, and that some rearrangement should be made in the primary school, in the high school or elsewhere, in order to reduce the time required.

Economy of Time in Preliminary and Medical Education

HON. P. P. CLAXTON, United States Commissioner of Education, Washington, D. C.: The high average age at which students begin their medical studies in this country is due to several causes. Many students pay their way through high school and college by going to school a year or two and then working one or more years for money with which to pay their school bills. Then after graduating from college they may teach one or more years before beginning to study medicine. The older age raises considerably the average age of all professional students and graduates.

Another important cause is the shortness of the school year. The usual length of the school year in American cities is less than 175 days after holidays are counted out, and the length of the average school day is five hours. In rural schools the average school year is from ten to seventy days shorter than in cities, the average difference being nearly forty days between city and country schools. In western European countries, in Canada, Australia, New Zealand and Japan, the school year is from 220 to 250 days. The principle of short hours for efficiency is no doubt correct in a measure, but we have carried the matter to an extreme, especially as it applies to the school year.

Another cause is irregular attendance. There are still states without compulsory school attendance laws, and in none of our states or cities are the attendance laws as rigidly enforced as in most European countries. The average daily attendance in our schools is not more than 70 per cent. of the enrolment, which means that an average of thirty out of a hundred enrolled are out of school daily. Then there is the lack of definite education and professional preparation on the part of teachers. In the rural schools a large proportion of the teachers are young and inexperienced. The average term of service does not exceed probably five years. The constant changing of teachers is another cause. Children in our schools change teachers so often that all continuity of study and teaching is lost. Then there is the lack of definite organization of courses of study, but most of the time lost in American schools is probably through the long drawn out elementary courses running through eight years and continuing two or three years after the beginning of adolescence, and the consequent postponement of the time of beginning high school subjects, by the attempt to crowd all secondary work into four years, and by a false policy in college administration which fails to make the first two years of college life as effective as they might be.

European countries gain much for the children of the upper classes and for all who are looking forward to the university and professional studies in life by making their secondary schools—the gymnasium, the realschule, the lycée, English public schools, etc.—to parallel their elementary schools in time rather than to follow them.

I should strenuously oppose any scheme for the reorganization of public education in this country based on class distinctions. I should oppose also any dual system of schools.

I believe in our democratic tandem system of elementary and secondary schools, but I believe it is possible to make a much better arrangement and use than we now do of twelve years' elementary and secondary schooling.

DISCUSSION

HARRY PRATT JUDSON, President, University of Chicago: The age at which students on the whole receive their M.D. degree is too advanced, and the causes are perfectly obvious. One is the utterly unrelated character of our American educational system. Every branch today is considered separate from everything else. Those in charge of medical education have steadily advanced the requirements for beginning medical work wisely and advisedly. Those entrusted with our colleges have and will advance their requirements for admission. In secondary schools, many subjects are taught which were not thought of a generation ago. In like manner, elementary schools have many studies which a generation ago were not heard of. Unfortunately there has been no correlative force in this country to view education as a whole or to bring it together in a systematic or coherent way. I believe the elementary school work can be covered in six, or at least in seven years, because we have tried and found that it can be done. We can save not only one year in this way, but ultimately, I believe, two years. What we need is a complete, drastic reorganization of our whole system of education involved in colleges and secondary schools preceding the professional work. It is not so much a knowledge of different things that students need, but a better training of the mind.

C. H. JUDD, Professor of Education, University of Chicago: We need the cooperation and intelligent sympathy of the community. When a school man starts to work out these reorganizations he commonly finds he is definitely opposed by the community. It is difficult to make the changes suggested when it comes to their administration. In the University of Chicago we have eliminated the eighth grade in the elementary school, but it was opposed by some of the patrons of the institution. There is a general movement at the present time in the United States toward the organization of what is known as the junior high school, but this is opposed in many quarters as an innovation inimical to the development of our American educational progress.

Thirty per cent. of our colleges today are going out of business, and the expansion of secondary schools has been enormous. In the last twenty-five years we have twice doubled the total population in our secondary schools. In 1890 there were 300,000 students in secondary schools; this year there were 1,300,000 students. It necessitates a complete reorganization of the elementary and secondary schools and the subjects taught, and by means of the junior high school there will be a welding together of the schools, which is of great importance. We need sufficient backing to carry the work out and to articulate the junior college with the high school. With the proper reorganization we could develop a satisfactory American system of education.

KENDRIC C. BABCOCK, Dean, College of Liberal Arts and Sciences, University of Illinois: All who have watched higher education and secondary education as connected with it agree that much time is wasted and that we should proceed at once to save as much of that time as possible. Doctors and educators are not agreed as to how that saving should be made. One reason for students getting their M.D. degree at an advanced age is the tendency of youngsters to change their minds. After spending four years in a high school, many do not want to pay the price of changing their minds. Many students in the premedical course have gone over to law or to some other subject, and afterward taken up medicine.

DR. GEORGE ROYAL, Des Moines, Iowa: The new president in the University of Michigan has gathered statistics showing what effect university training has had on students. He found that the really successful or prominent men were those who graduated at 22 and 23, and that those who graduated at 25 or later were not, as a rule, so successful. Two years can be saved before students reach the medical college.

DR. H. GIDEON WELLS, Chicago: The University of Chicago has a quarterly system which permits a student to work eleven months in the year instead of nine, which enables him to do more work, although it does not shorten the period at which he may graduate.

DR. S. B. MCCORMICK, Pittsburgh: It is necessary to educate the people in regard to this plan of saving one or two years' time in preliminary studies. The time is coming when many institutions which are now colleges will become junior colleges and be incorporated under the general public system of education. If we have cooperation, we shall ultimately eliminate much of the waste of time.

MR. AUGUSTUS A. DOWNING, Albany, N. Y.: I consider it a crime against the child and against the community to turn a child lose from the elementary school and high school at the end of June and let them go anywhere and everywhere until the first of September. They would be better off if the school term were materially lengthened.

(To be continued)

NEW YORK ACADEMY OF MEDICINE

Meeting held Jan. 18, 1917

DR. EDWARD D. FISHER in the Chair

Etiology of Typhus Fever in Mexico

DRS. P. K. OLITSKY, B. S. DENZER and C. E. HUSK: This report presents the results of an expedition into Mexico during the early part of 1916 for the purpose of studying typhus fever. The work was done in Matehuala, Central Mexico, a town of 10,000, in which the estimated number of cases during the winter months was 500. The mortality was 20 per cent. Clinically, the disease corresponded to the classical type. The scientific work consisted in virus and bacteriologic studies, serologic tests, work on the pathogenicity of the organism recovered from the blood, and prophylactic inoculation with a vaccine made from the *Bacillus typhi-exanthematici*. The virus studies confirmed previous observations that the blood of typhus fever patients removed during the height of the disease and injected into guinea-pigs produces a rise in temperature of from four to eleven days' duration after the incubation period of from seven to fourteen days. The Mexican virus was transmitted in this manner through three generations of animals. Blood cultures were taken in thirty-one cases and numerous controls. The technic and mediums employed were those used in the original studies in New York in 1914, except in three cases. Of the twenty-eight cultures made on 2 per cent. glucose serum agar, only eight could be followed a sufficiently long time. These eight cultures showed an organism identical with that first isolated and described by Plotz in 1914. Agglutination tests performed on the serum of typhus fever patients with the *Bacillus typhi-exanthematici* confirmed the previous findings. The organism obtained from the blood, as well as that isolated from lice, was identified by its morphologic and cultural characteristics and serologic reactions. The organism is a slender bacillus about 1 micron in length, usually gram-positive, although many strains are gram-positive. It is an obligatory anaerobe, and grows sparsely on 0.5 per cent. serum glucose agar; it ferments glucose, maltose, inulin and galactose, and fails to ferment lactose, mannite and saccharose. Agglutination, using endemic typhus serum against Mexican strains, showed positive reactions in four out of five of those tested. In like manner, complement fixation tests against typhus immune serum showed uniformly positive results, and uniformly negative results with nontyphus serum. In a word, there is a complete correspondence culturally and serologically of the Mexican organism with the bacillus of Plotz. Experiments on guinea-pigs indicated that the organism is pathogenic for this animal in the original culture, and loses its virulence on repeated cultivation.

Isolation of the Bacillus Typhi-Exanthematici from the Body Louse

DRS. P. K. OLITSKY, B. S. DENZER and C. E. HUSK: Up to the time of the Mexican expedition, all cultural work proved fruitless. One of the results of the expedition was the finding of the same organism in infected lice which Plotz reported

as the etiologic agent of typhus fever. The work in Mexico on typhus-infected lice may be grouped into (1) the production of typhus fever by the injection of infected lice and (2) the isolation of the typhus bacillus from such lice. In two instances the injection of thirty and sixty-five lice, respectively, intraperitoneally into guinea-pigs led to the production of typhus fever. In the one case cultured the typhus bacillus was recovered from the spleen of the guinea-pig. Six series of lice taken from five different typhus patients were cultured. From all of these lice, the typhus bacillus was isolated. In all the experiments made, these lice were proved infectious. A striking observation was that these organisms are usually gram-negative in the original colonies. After one or two subcultures they become definitely gram-postive. Since 1910 many observers have reported the finding of an organism in typhus-infected lice but not in normal lice. This organism is believed to have a causal relationship to typhus fever. In Mexico we were able to grow the bacterium and to show that morphologically, culturally and serologically it is identical with the typhus bacillus.

Etiology and Epidemiology of the Typhus Fever of Eastern Europe

DRS. G. BAEHR and H. PLOTZ: The bacteriologic studies made on sixty-four individuals with the disease demonstrated that the *Bacillus typhi-exanthematici* is regularly present in the blood of people suffering from the typhus fever of eastern Europe. In Volhynia anaerobic blood cultures were positive in nineteen out of twenty-four cases, or 79 per cent. of the cases studied. In the Balkans, where blood cultures often could not be placed in an incubator until four or five days after they were taken, the percentage was lower, 47.5. The relative bacteremia was also proportional to the severity of the disease. For example, in the Russian typhus in which the mortality was 5.5 per cent. and in the Balkan 1915-1916 typhus in which it was 11 per cent., the bacteremia was greater than in the New York series in which the mortality was negligible, 0.2 per cent.; it was much less than in the Mexican typhus (mortality about 20 per cent.) or the severe Balkan type of the disease (mortality from 18 to 60 per cent.). It was found, furthermore, that during chills enormous numbers of organisms may be present in the blood, the maximum being 1,183 colonies in 13 c.c. of blood. Morphologically, culturally and serologically, the organisms recovered from these Russian and Balkan patients were identical with those originally recovered in the New York cases. The *Bacillus typhi-exanthematici* has therefore now been recovered by the authors and others from typhus fever patients in the United States, Mexico, Serbia, Bulgaria, Austria and Russia. The maximum titer of agglutinins for *Bacillus typhi-exanthematici* in the blood of the cases studied was 1:1,600; the average was 1:200. As a result of systematic studies carried out in 100 cases of typhus fever, it was found that agglutinins usually first appear in the blood on about the tenth or eleventh day of the disease, or at about the time when the temperature begins to break. The agglutinin titer of the serum then rapidly increases as the temperature drops to normal, and reaches its maximum toward the end of the first or the beginning of the second week of convalescence. At this time 97 per cent. of the serums were positive. After this time the agglutinins diminish in amount very slowly, and usually persist in the blood for many months. The curve of the development of specific agglutinins in typhus fever is therefore a typical immunity curve. During the course of the work, specific agglutinins and complement-fixing antibodies were found in the blood of twenty normal persons, in amounts otherwise observed only in convalescents from typhus fever. None of these persons had ever shown any clinical manifestations of typhus fever. These twenty patients were either physicians, nurses or male attendants in typhus hospitals in which they were constantly handling typhus patients, or they were peasants who had been living with relatives or friends ill with the disease. As these twenty contacts were the only persons, aside from typhus convalescents, in whom such findings were made, it was reasonable to assume that during the time of their exposure to typhus fever they had actually been infected with the bacilli in quantities sufficient to induce the clinical manifestations of the disease, and had reacted with the production of specific antibodies. Such persons, who have probably become immune without having the disease, may act as carriers of infected lice and be agents of their distribution throughout a community.

Studies in Prophylactic Immunization with the Bacillus Typhi-Exanthematici

DRS. H. PLOTZ, P. K. OLITSKY and G. BAEHR: Vaccination was carried out in Serbia, Bulgaria, Russia and Mexico during the winter of 1915-1916. The vaccinations were restricted as far as possible to those persons who were most exposed to infection. In addition to the doctors, nurses and orderlies, many other hospital units were vaccinated, and in a few instances small military groups. The reactions following vaccination were very slight. Among the 5,251 vaccinated persons in Bulgaria, there occurred only three cases of typhus fever; one of the patients died. After completion of vaccination, although 300 patients were admitted in the subsequent three weeks, no further house infection occurred. In Volhynia 3,169 persons in forty-six institutions were vaccinated, and up to May, 1916, there occurred only three cases of typhus fever among those vaccinated. About 2,000 were vaccinated in Mexico, but owing to the fact that the men carrying on the work had to leave Mexico, no statistics are as yet available. Whatever reports have come from Mexico up to the present time seem to be favorable. Altogether 8,420 persons, members of 109 hospital, sanitation and other units in Serbia, Bulgaria and Volhynia were vaccinated during the epidemic of 1915-1916, and only six of this number developed the disease during the four months of the epidemic.

DISCUSSION

DR. GEDIDE A. FRIEDMAN: I have observed typhus fever in Russia during three epidemics and I have also seen many sporadic cases. I was glad to hear a confirmation of the opinion I expressed six years ago about ambulatory typhus cases. I have seen such patients over and over again, sometimes with high temperature, who gave a history of having been sick five or six days. I was interested to hear of the severe chills which occurred in some of the cases seen in the Balkans. It is a peculiar fact that typhus fever manifests itself in the beginning with chills, which were not seen in other diseases, except perhaps malaria, and I have seen cases wherein the chills lasted for hours. I have occasionally observed chills in children, but very rarely; commonly typhus in children does not begin with a chill, or perhaps a slight chill might be overlooked. The mild course of the typhus tabulated in the statistics might be explained by the fact that most of the patients were Jews, and I have emphasied the fact that the course of typhus in some races, such as the Jews and Arabs, was mild and the mortality was not so high as among other races. The most severe cases occurred among the Russian peasants. As to the body louse being the transmitting agent, I could add from my own experience that this is probably true because typhus is a disease of the poorer classes. I have rarely seen it among the well to do.

DR. NATHAN A. BRILL: There is not the slightest doubt in my mind that the *Bacillus typhi-exanthematici* is the only cause of typhus fever, and that the body louse is the agent of transmission of the epidemic form of the disease to man. There is some doubt in my mind whether it is the only agent concerned in the transmission of the endemic form of typhus fever. It has been conclusively shown by Nicolle, Anderson and Goldberg that the body louse is rendered inactive by temperatures above 20 C. (68 F.) that the optimum temperature for its life and activity is between 12 and 14 C. (53.6 and 57.2 F.), and that it is impossible to keep lice alive in the presence of food in test tubes exposed even to the moderate temperature of the vest pocket. The effect of heat on the body louse is utilized by the peons of Mexico, whose important article of dress is the blanket, which is used for all purposes of covering. To rid their blankets of lice they expose them to the warm rays of the sun, and on shaking them thereafter, the lice thus rendered lethargic fall off and are removed. It appears that the body louse is active in cold and inactive in warm temperatures. This fact would explain

many of the epidemiologic features of *epidemic* typhus fever, a disease chiefly confined to the colder regions of the earth, and when it does occur in the warmer latitudes it is restricted in the main to the highlands where the daily temperature is low. All statistics will show, whether you search the English, the German or the Russian, in all of whose countries epidemic typhus fever has repeatedly appeared, that this form of the disease is rampant in the winter and diminished in severity and in the number of infected people as the summer approaches, when it disappears almost entirely. When, on the other hand, one studies the facts which relate to the endemic form of typhus fever as it existed in New York City, it is found that by far the greatest number of cases of endemic typhus fever occur during the summer months, when according to investigators the body louse is inactive and does not live. A study of the statistics dealing with this point shows that 60 per cent. of all endemic typhus fever cases occurred in the four summer months, between June and October, while the remaining 40 per cent. were distributed over the other eight months of the year, with by far the fewest cases in the winter, the very reverse of the situation as regards the epidemic form of the disease. This induces me to believe that either we shall have to modify our views in reference to the effects of temperature on the body louse, which seem fairly well established, or that we shall have to look for some other agent of transmission of the infection in the endemic form of typhus fever. Another argument in support of this view is furnished by the fact that house and family infection of the endemic form of this disease practically does not exist. In over 400 cases of this form of the disease observed by me, I have never seen more than one member of a family affected at even approximately the same time until last spring, when the first cases of nearly simultaneous infection of husband and wife were seen in the hospital. If the body louse transmits the endemic form of the disease, one would expect marital infections to be very common. Such infections are extremely rare and practically nil. Therefore, while I am not prepared to say that the body louse is not an agent in the transmission of endemic typhus fever, I hope to see more positive proof than has been offered that there is no other source and agent of infection in the endemic form of the disease.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, Boston

January, VII, No. 1

1 Necessity for Health Standards. D. B. Armstrong, New York.—p. 1.
2 Some Shortcomings of Sociosanitary Investigations. F. Schneider, Jr.—p. 3.
3 Application of Statistical Method to Public Health Research. L. I. Dublin, New York.—p. 14.
4 Survey of Dairy Score Cards. C. E. North, New York.—p. 25.
5 Housing Conditions as Factors in Production of Disease. J. Ford, Boston.—p. 42.
6 Model Law for Reporting Stillbirths. L. W. Thomas, Brooklyn.—p. 46.
7 Improved Technic in Bacterial Air Analysis. W. W. Browne, New York.—p. 52.

American Journal of Roentgenology, New York

January, IV, No. 1

8 *Roentgenologic Treatment of Five Hundred and Thirty Cases of Malignant and Other Tumors of Face. H. W. Dachtler, Toledo, Ohio.—p. 599.
9 *Roentgen Ray Treatment of Tuberculous Peritonitis. P. Eisen, Chicago.—p. 602.
10 *Treatment of Nevi. W. S. Newcomet, Philadelphia.—p. 605.
11 *Present Status of Roentgenotherapy in Leukemia. H. K. Pancoast, Philadelphia.—p. 611.
12 Comments on Roentgenography. A. Soiland, Los Angeles.—p. 613.
13 Knife Blade in Brain. E. Blaine, Chicago.—p. 622.
14 Bed Support. D. R. Bowen, Philadelphia.—p. 625.

8, 9, 10 and 11. Abstracted in THE JOURNAL, Nov. 4, 1916, p. 1392.

Cleveland Medical Journal

December, 1916, XV, No. 12

15 *Pyloric Stenosis in Infancy. H. G. Sloan, Cleveland.—p. 761.
16 Case of Fracture of Base of Skull and Some of Its Characteristic Symptoms. A. Peskind, Cleveland.—p. 776.
17 *Obscure Case of Empyema. A. Peskind, Cleveland.—p. 788.
18 *Fate of Iodin, Iodids and Iodates in Body. T. Sollmann, Cleveland.—p. 792.
19 Case of Ethmoiditis in Child, Complicated by Unilateral Exophthalmus. D. A. Prendergast, Cleveland.—p. 802.

15. **Pyloric Stenosis in Infancy.**—Sloan recommends the Rammstedt operation for these cases. Vomiting is seen much less than after gastro-enterostomy. In case the baby cries for fifteen minutes or over, the author advocates giving paregoric, 30 drops, to keep it quiet during the healing of the wound. There is practically no shock when the surgical procedure is carried out on the principles outlined. Food is taken as in a normal infant and the weight gain is immediate and progressive. So far, literature contains no account of the recurrence of the symptoms following the Rammstedt operation.

17. **Case of Empyema.**—The most interesting features in Peskind's case was that the child must have originally suffered from a latent pneumonia or pleuropneumonia of the upper right lung, which culminated in a small interlobar encysted empyema, perhaps in the pleuropericardial fold.

18. **Iodin, Iodids and Iodates in Body.**—The immediate object of Sollmann's investigation was to determine these questions: (1) whether the administration of elementary iodin can result in the appearance of iodid and iodate in the blood or tissues, and (2) whether elementary iodin can be liberated from iodid and iodate, combined or separately, with the reaction (hydrogen-ion concentration) that is known to exist in the body. The following results were found: Tests depending on the liberation of small quantities of iodin cannot be applied to protein-containing fluids, or to urine, since considerable iodin is immediately bound by the aromatic radicals. Under the conditions used, the amount of iodin bound by serum was about 1:3,000. By the use of the dialysis method it was shown that neither iodid nor iodate undergo any change in the serum. Free iodin is promptly bound, with the formation of iodid, but no iodate is formed, even in the presence of alkali, so that subsequent acidulation does not liberate iodin (unless, of course, more iodin has been added than can be disposed of by the serum). The statements hold also for other proteins, urine and phenol. Large doses of free iodin, administered by stomach, exist in the blood solely as iodid. The addition of acid to the blood does not regenerate iodin. No iodin is liberated from iodid iodate or iodid nitrite, or iodate sulphocyanid mixtures, until the acidity surpasses Hp = 4.49. It is therefore impossible that iodin should be liberated from iodid under any conditions existing in the body (excepting solely the gastric juice). On the other hand, the alkalinity of the body is not sufficient to bind any noticeable quantity of free iodin—even in the absence of proteins and aromatic groups. The questions that were proposed are therefore answered in the negative.

Colorado Medicine, Denver

January, XIV, No. 1

20 Spontaneous Pneumothorax in Tuberculous. C. O. Giese, Colorado Springs.—p. 4.
21 Duodenal Ulcer. J. L. Mortimer, Denver.—p. 10.
22 Medical Education and Public Health. L. Farrand, Boulder.—p. 15.
23 Some Frequent Complications Following Operations for Acute Appendicitis. F. N. Cochems, Salida.—p. 17.
24 Status of Medical Care in Modern Industries. J. M. Shapiro, Denver.—p. 22.
25 Dermoid Cyst of Ovary in Child of Five Years. G. H. Cattermole, Denver.—p. 25.

Florida Medical Association Journal, Jacksonville

January, III, No. 7

26 Practical Policy. O. Dowling, Shreveport, La.—p. 107.
27 Practicing Physician's Responsibility in Public Health Work. C. P. Knight, Stapleton, N. Y.—p. 200.
28 Medical Aspect of Navy. A. J. Toulon.—p. 202.

29 Simulated Blindness and Its Detection. M. A. Lischkoff, Pensacola.—p. 204.
30 Treatment of Syphilis of Central Nervous System. H. M. Smith, Chattahoochee.—p. 206.
31 Urinalysis. F. A. Brink, Pensacola.—p. 211.
32 Glandular Tuberculosis of Childhood. D. W. McMillan, Pensacola.—p. 212.
33 Some of Recent Ideas on Infant Paralysis. J. H. Fellows, Pensacola.—p. 214.

Journal of Experimental Medicine, Baltimore

February, XXV, No. 2

34 *Venom Hemolysis After Splenectomy; Resistance of Erythrocytes of Normal Dogs to Hemolytic Activity of Cobra Venom. J. A. Kolmer, Philadelphia.—p. 195.
35 *Effects of Serum Treated with Pararabin. E. Zunz and C. Mohilevith, Lausanne, Switzerland.—p. 211.
36 *Studies on Blood Proteins. Albumin Globulin Ratio in Experimental Intoxications and Infections. S. H. Hurwitz and G. H. Whipple, San Francisco.—p. 231.
37 *Nymph and Prosopon of Tsutsugamushi, Leptotrombidium Akamushi, N. Sp. M. Nagayo, Y. Miyagawa, T. Mitamura and A. Imamura, Tokyo, Japan.—p. 255.
38 Is Trombidium Holosericeum the Parent of Leptus Autumnalis? M. Nagayo, Y. Miyagawa, T. Mitamura and A. Imamura, Tokyo, Japan.—p. 273.
39 *Study of Pancreas Intoxication. E. W. Goodpasture. Boston.—p. 277.
40 *Cyclic Changes in Mammary Gland Under Normal and Pathologic Conditions. Changes in Nonpregnant Guinea-Pig. L. Loeb and C. Hesselberg, St. Louis.—p. 285.
41 *Id. Changes in Pregnant Guinea-Pig: Effect of Luetin Injections. L. Loeb and C. Hesselberg, St. Louis.—p. 305.
42 Comparative Study of Certain Actions of Epinephrin in Cat and Rabbit. T. S. Githens, New York.—p. 323.
43 *Significance of Epithelial Cells and Saprophytes in Sputum. M. Otani, Tokyo, Japan.—p. 333.
44 Cultivation of Trichomonas of Human Mouth (Tetratrichomonas Hominis). T. Ohira and H. Noguchi, New York.—p. 341.

34. **Venom Hemolysis After Splenectomy.**—Since the phenomenon of venom hemolysis appears to be intimately associated with the lecithin or ether soluble activators present in erythrocytes, particularly fatty acids and their soluble soaps, and the removal of the spleen has been shown to alter the content of fatty substances in the blood, the resistance of erythrocytes to venom before and after splenectomy was investigated by Kolmer. He found that the resistance of erythrocytes of dogs to the hemolytic activity of cobra venom is increased after splenectomy. This increased resistance was observed as early as four days after splenectomy and usually persisted for a period of about three weeks, when the resistance gradually decreased to normal or slightly beyond. The decrease of resistance to the hemolytic activity of venom for the erythrocytes of splenectomized dogs following the primary increase is apparently coincident with the anemia following splenectomy. An intercurrent infection, such as distemper, tends to reduce the resistance of erythrocytes to venom. An increased resistance of the erythrocytes to hypotonic salt solutions was found with all the splenectomized dogs in which these tests were made. Increased resistance to hypotonic salt solutions apparently persists for a longer period than the increased resistance to cobra venom. As the lysis of erythrocytes by venom is dependent on the presence of certain lipoidal substances within the cells, and as the spleen may exercise an influence over the lipoidal contents of corpuscles and serum, it is suggested by the author that the increased resistance of erythrocytes to the hemolytic activity of venom after splenectomy is due to alterations in the lipoid content of the erythrocytes.

35. **Effects of Serum Treated with Pararabin.**—Horse serum, kept for two hours at 38 C. in the presence of one fifth its volume of a suspension of 0.5 per cent. of pararabin in physiologic salt solution and then freed by means of centrifugalization and filtration from the pararabin, produced, when injected in appropriate doses into a normal rabbit, a considerable and prolonged fall of the blood pressure, a distinct retardation in the coagulation of the carotid blood, and, sometimes, in addition, acceleration of the respiratory rate and the expulsion of numerous scybala; that is, the various symptoms observed to occur after the intravenous injection of horse serum in sero-anaphylactized rabbits. If the horse serum is first heated for thirty minutes to 56 C. and then treated with pararabin in the manner described above, the intravenous injection of this serum into a normal rabbit exerts no more action on the arterial pressure, the coagulability of the arterial blood, the respiratory rate, and the intestinal activity, than does normal horse serum when introduced into the vein of a normal rabbit.

36. **Albumin Globulin Ratio in Experimental Intoxications and Infections.**—The intoxication which develops as the result of a simple obstruction or a closed intestinal loop is accompanied by an alteration in the normal albumin globulin ratio of the blood serum; the globulin fraction is greatly increased and at times the normal relation of the two fractions may show a complete inversion. The increase in the globulin content of the blood serum is most marked in the animals which show some of the complications met with in loop animals, rupture of the loop and peritonitis. In the latter conditions especially, the globulin increase is rapid and large. The authors believe this reaction to be of diagnostic value in acute infections attended by the sudden liberation and absorption of a toxic exudate. Infections and intoxications produced by inflammatory irritants are also accompanied by a rise in the blood globulins. This observation suggests that tissue disintegration with absorption of toxic products is responsible for the changes noted, and that bacterial invasion is important only in so far as it gives rise to toxic substances. Animals which have developed a tolerance to proteose intoxication following the periodic injection of small doses of proteose, do not show a globulin increase. These experiments do not support the view that the rise in globulins observed in these experimental conditions is an expression of a resistance or tolerance developed by the animal. From the experimental evidence it seems more probable that the alteration in the partition of the blood protein fractions is one of the results of the metabolic disturbance which has been shown to occur in these conditions.

37. **Nymph and Prosopon of Tsutsugamushi.**—Tsutsugamushi or kedani disease is an acute exanthematous infectious disease, which at present occurs only in the northern coast districts of Japan, namely, in Niigata ken, Akita ken and Yamagata ken. Recently it has also been found to exist in Formosa. The mortality of the disease varies, according to the district and year, between 20 and 50 per cent. It closely resembles Rocky Mountain spotted fever, but it possesses some distinct features. The specific cause of the disease has not yet been established with certainty. That tsutsugamushi disease is transmitted to man by a diminutive mite, is now established. Brumpt considered it to be a larva of a new trombidium, which he called *Trombidium akamushi*. The nymph and the prosopon of the tsutsugamushi, however, do not bite warm blooded animals. That the investigation of this mite has so far been neglected is chiefly due to the danger of the bite which causes the disease, and to which the investigators are exposed while working in the infected region. The authors report on the nymph and the prosopon of the tsutsugamushi.

39. **Pancreas Intoxication.**—According to Goodpasture a toxic constituent is present in the fresh pancreas of dogs before trypsinogen can have been activated. The toxic fraction is present in the betanucleoprotein, and therefore is thermostable. It is gradually destroyed by autolysis but can be obtained in concentrated form from a gland which has autolyzed twenty-four hours. The toxic material is probably protein in nature. Intravenous or intraperitoneal injection of from 0.05 to 0.1 gm. per kilogram of body weight is usually fatal and elicits in dogs symptoms comparable to those of spontaneous hemorrhagic necrosis of the pancreas. Dog pancreas differs from that of beef or pig in that guanylic acid and toxic protein combined with it are slowly broken down by autolysis. After autolysis of dog pancreas the toxic protein and guanylic acid may be separated and obtained in relatively pure form.

40. **Changes in Nonpregnant Guinea-Pig.**—The authors found that a definite cycle exists in the mammary gland of the nonpregnant guinea-pig which corresponds to the cycle in the ovary and uterus. Extirpation of the ovaries prevents not only the proliferation of the mammary gland associated with the first stage of the sexual cycle, but in all probability also

inhibits the proliferation of the mammary gland which occurs under certain conditions toward the end of the sexual cycle, or in instances of experimentally prolonged sexual cycle in which well preserved corpora lutea and deciduomas are present. In animals in which the ovaries were hypotypical, the mammary glands were in an inactive condition. The presence of hypotypical ovaries has the same influence on the mammary gland as castration. Complete extirpation of the corpora lutea seems directly or indirectly to prevent the secondary proliferation of the mammary gland, which occurs during the latter part of the sexual cycle or during an experimentally prolonged cycle, in cases in which the extirpation is not followed at once by a new ovulation. In cases in which the whole or almost the whole uterus had been extirpated, the corpora lutea were well preserved and the mammary gland was proliferating.

41. **Changes in Pregnant Guinea-Pig.**—In the pregnant guinea-pig proliferation of the mammary gland becomes regular only at a later stage of pregnancy; namely, during the period following the twenty-fourth day of pregnancy. Previous to this period proliferation was absent in the majority of cases. After the completion of pregnancy and in the beginning of secretion some mitotic proliferation may still be present, but it soon ceases. Some proliferative stimulus seems still to be active. In cases in which abortion took place in the first half of pregnancy, secretion in the gland was not established; secretion occurred in two animals aborting toward the latter part of pregnancy. In guinea-pigs castrated during an early period of pregnancy, in which pregnancy continued for some time, proliferative changes were absent in the mammary gland. Extirpation of the corpora lutea during pregnancy induces a new ovulation and with it the primary proliferation in the mammary gland; abortion does not necessarily prevent these proliferative changes. Five injections of cow's lutein given in relatively large quantities intraperitoneally do not produce proliferation of the mammary gland in the guinea-pig.

43. **Epithelial Cells and Saprophytes in Sputum.**—Microscopic examination of sputum that has been washed with isotonic salt solution, Otani says, indicates its source. Sputum from above the vocal cords contains polygonal flat epithelial cells and numerous species of nonpathogenic micro-organisms. Sputum from below the cords is clear of saprophytes, although it sometimes contains broncho-alveolar cuboidal cells. In every instance he found erythrocytes in the pulmonary sputum after severe pulmonary hemorrhage. Six cases of laryngeal affection referred to in the paper had had no subjective symptoms, but microscopic examination showed tubercle bacilli in the laryngeal sputum.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

January, IX, No. 4

45 *Salicylates. Salicylate in Blood and Joint Fluid of Individuals Receiving Full Therapeutic Doses of Drug. R. W. Scott, T. W. Thoburn and P. J. Hanzlik, Cleveland.—p. 217.
46 New Time Marker. C. C. Lieb, New York.—p. 227.
47 *Pharmacology of Stovain. M. I. Smith and R. A. Hatcher, New York.—p. 231.
48 *Elimination of Hexamethylentetramin (Urotropin) as an Index of Renal Function. K. G. Falk and K. Sugiura, New York.—p. 241.

45. **Salicylate in Blood and Joint Fluid.**—The concentration of salicylate in the blood and joint fluid of individuals suffering with rheumatic fever and receiving full therapeutic doses of sodium salicylate was estimated by the authors. The results indicate that the concentration of salicylate in both fluids does not differ markedly, being somewhat less, on the whole, for the joint fluid, as might be expected. The following average concentrations were found: 0.02 per cent. for blood and 0.018 per cent. for joint fluid. The concentration of salicylate tends to be less in the blood of rheumatic than nonrheumatic individuals. There was no demonstrable free salicylic acid in the joint fluid of rheumatic fever patients. The true reaction and the reserve alkalinity of the blood were not perceptibly altered by the administration of salicylate even in large doses.

47. **Pharmacology of Stovain.**—Experiments made by Smith and Hatcher afforded no evidence that stovain exerts any direct action on the blood vessels after the intravenous injection in cats, and it failed to change the caliber of the renal vessels of the cat or dog when perfused in concentrations of 1:10,000 to 1:2,500. It depresses the heart when toxic doses are injected intravenously, and when the rabbit's heart is perfused with a solution containing 1 part of the drug in 10,000 parts of Locke's solution. Stovain causes death by inducing immediate and simultaneous paralysis of the heart and respiration, the action on each being independent of that on the other. Stovain disappears rapidly from the blood stream after its intravenous injection. Little or none, of the drug is excreted unchanged in the urine of the cat. Stovain is slightly, but distinctly, more toxic than novocain by similar modes of administration, and complete recovery does not follow the administration of toxic doses of stovain so promptly as it does that of corresponding doses of novocain.

48. **Elimination of Hexamethylentetramin.**—The object of this paper is to show the possible use of hexamethylentetramin as a test for renal function. In none of twelve cases diagnosed clinically in general terms as "nephritis" was any hexamethylentetramin excreted. A case diagnosed as "nephritis and gout" showed results similar to those diagnosed as nephritis. Three cases of gout gave normal hexamethylentetramin excretion, slightly low dye and high nonprotein nitrogen tests, high uric acid, and in two of the three, normal test meal results. In two cases diagnosed as cirrhosis of the liver, the excretion of hexamethylentetramin was low or zero. The nonprotein nitrogen and uric acid findings were normal but the test meal results showed impairment of kidney function.

Nebraska State Medical Journal, Norfolk

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49 Uses of Saline Solutions in Surgery. C. H. Breuer, Lincoln.—p. 201.
50 Streptococcic Grippe and Its Relationship to Scarlet Fever. M. G. Wohl and A. K. Detwiler, Omaha.—p. 205.
51 Apparatus Used in Treatment of Fractures. J. P. Lord, Omaha.—p. 209.
52 Infectious Streptococcic Diarrhea of Dysenteric Type; Report of Four Fatal Cases in One Home. G. W. Covey, Lincoln.—p. 213.
53 Case of Diabetes Associated with Renal Tuberculosis. B. R. McGrath and R. C. Woodruff, Grand Island.—p. 216.

New York Medical Journal

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54 Prevention and Retardation of Cardiovascular Disease. C. L. Greene, St. Paul.—p. 145.
55 Secondary Mastoiditis. R. C. Myles and J. M. Smith, New York.—p. 148.
56 Bronchial Asthma and Its Curability. J. L. Tracy, Toledo.—p. 149.
57 Possible Clues to Nature of Genius. A. C. Jacobson, New York.—p. 152.
58 Anesthesia and Acidosis. H. A. Sanders, New York.—p. 154.
59 Case of Addison's Disease. A. E. Oliensis and J. A. Mendelson, Philadelphia.—p. 156.
60 Influenza vs. Tuberculosis. B. Frankel, New York.—p. 158.
61 Huntington's Chorea. L. Grimberg, New York.—p. 160.
62 Mercurialized Serum and Bichlorid of Mercury. P. S. Pittenger, Philadelphia.—p. 161.

South Carolina Medical Association Journal, Greenville

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63 Affections of Posterior Urethra. W. R. Barron, Columbia.—p. 400.
64 Necessity of Graphic Illustration of Sanitary Conditions in Community. M. R. Mobley, Florence.—p. 404.
65 Need of and How to Obtain Hospital in Every County in South Carolina. L. H. Jennings, Bishopville.—p. 407.
66 Hemorrhage of New-Born; Report of Case. H. L. Shaw, Fountain Inn.—p. 408.
67 Should Tonsils Be Removed? W. P. Porcher, Charleston.—p. 409.
68 The Nose. N. T. Clark, Spartanburg.—p. 412.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

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69 Atonic Conditions of Stomach and Colon. F. B. Turck, New York.—p. 313.
70 Corneal Ulcers. L. C. Kuyrkendall, McAlester.—p. 330.

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71 Treatment of Certain Types of Goiter with Quinin and Urea Injections. L. F. Watson, Oklahoma City.—p. 341.

72 Operations for Acute Gonorrheal Epididymitis. J. Frischer, Kansas City, Mo.—p. 347.
73 Physician in Politics. B. L. Jenkins, Clarendon, Texas.—p. 355.

Surgery, Gynecology and Obstetrics, Chicago

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75 Id. F. T. Stewart, Philadelphia.—p. 141.
76 *Surgery of Peripheral Nerves. C. A. Porter, Boston.—p. 144.
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78 *Resection of Thyroid. E. H. Pool, New York.—p. 150.
79 *Fatal Complications of Percy's "Cold Iron" Method in Treatment of Inoperable Carcinoma of Cervix. V. N. Leonard, New York and A. B. Dayton, Baltimore.—p. 156.
80 Technic of Transvesical Prostatectomy (Two-Stage Operation). P. M. Pilcher, Brooklyn.—p. 162.
81 Evaluation of Trauma Factor in Hernia, Malignancy and Tuberculosis. O. J. Fay, Des Moines, Iowa.—p. 177.
82 Syphilis of Bladder (Report of Case and Review of Literature). T. Baker, Pittsburgh.—p. 187.
83 *Surgery of Bronchiectasis. S. Robinson, Rochester, Minn.—p. 194.
84 Enormous Hernias; Report of Two Cases. W. R. Hewitt, St. Louis.—p. 215.
85 Exostoses of Orbit; Report of Case. F. L. Hupp, Wheeling, W. Va.—p. 221.
86 *Ectopic Pregnancy; Report of One Hundred and Six Cases. F. R. Oastler, New York.—p. 224.
87 Technic of Thyroid Operations with Local Anesthesia, Scopolamin and Morphin. F. H. Lahey, Boston.—p. 229.
88 *New Method of Continuous Drainage for Empyema. H. B. Philips, New York.—p. 236.
89 Liquid Heat Apparatus to Supplant Electric Cautery Used by Percy. J. T. Mason, Seattle, Wash.—p. 242.
90 *New Method of Applying Autogenous Intramedullary Bone Transplants and of Making Autogenous Bone Screws. E. J. Hoglund, Chicago.—p. 243.
91 End-To-End Anastomosis of Colon. P. Lockhart-Mummery, London.—p. 247.

76. **Surgery of Peripheral Nerves.**—Porter studied 187 cases of peripheral nerve lesions. In four cases of facial paralysis attempts at suture were made: one primary after a razor cut, with unknown result; one six months after a pistol wound, suture of the eleventh to the seventh nerve, no improvement. The third, complete paralysis thirteen years after a convulsion. The facial was split and a slip of the hypoglossal placed in the niche. Fifteen years afterward there is partial recovery. In the fourth case, following a mastoid operation two years before, the facial was anastomosed to half of the hypoglossal. Ten years afterward there are weak voluntary facial movements, though faradic response is good. In one case of brachial plexus lesion, operated on four months after the accident, all of the cords found hopelessly blended in a mass of scars were excised and an entirely new plexus constructed, which, Porter says, would defy a professor of anatomy. In this case flexion of the wrist first began three years after operation, improvement continued, and now, while there is flexion of the arm, wrist and fingers, and some power in the triceps, the extensors are paralyzed.

The results after musculospiral paralysis are very satisfactory. The nerve has been freed from adhesions or bony callus in eleven cases; with marked improvement in nine; failure in one; one not heard from. There have been fourteen sutures; six have been successful. In 1913, Porter transplanted 4 inches of a dog's sciatic between the ends of the nerve. There has been no improvement. The longest case was one of resuture six years after an unsuccessful union; result unknown, probably failure. One primary suture recovered in eleven months. There have been forty-eight cases of suture of the ulnar and median nerves. A few of the primary sutures have been almost perfect, as has one (3 months old) secondary suture of the ulna in the arm three years after the operation. The results of the majority were unsatisfactory, though trophic disturbances have usually been prevented. Porter has operated three times on the posterior nerve roots, for pain, never with complete success. He is certain that in addition to the division of the roots forming the brachial plexus that the fourth cervical and second dorsal should also be cut. Porter sounds a note of warning about tourniquet paralysis. A rubber tube should never be used about the midarm. Even if the arm is padded the nerve may be crushed against the bone.

78. **Resection of Thyroid.**—In large, diffuse, simple goiters, Pool says, double resection is the procedure which most closely meets all indications. It relieves pressure, minimizes danger to parathyroids and recurrent laryngeal nerve, provides a sufficiency of thyroid tissue, and ensures symmetry. Double resection may be carried out readily with little hemorrhage either by Balfour's method or by the use of a clamp as described, or by a combination of the two methods.

79. **Complications of Percy's "Cold Iron" Method.**—The authors are convinced from a short experience with Percy's method, that fatalities must have been frequent wherever this method has been used extensively. They report two fatal cases. The development of a septicemia from the infected tissue at the coagulated area was the cause of death. The Percy technic was applied most rigidly. Nevertheless, microscopic sections show active uninjured carcinoma, respectively, four, eight and sixteen days afterward. In both cases it was found within 1 centimeter of the previous site of the heating iron. The necrotic mass produced by the cautery forms a particularly favorable medium for bacterial growth. The organisms may spread to the surrounding tissues or reach the general circulation through the local thrombosed vessels. The technic is considered by the authors to be ineffectual in eradicating the carcinoma.

83. **Surgery of Bronchiectasis.**—Included in Robinson's paper is a report of five complete resections of the lower lobe of the lung, with one death. Excision of the diseased portion of one lung, Robinson says, is the only curative treatment of advanced bronchiectasis. Medications, inhalations, intratracheal injections, intratracheal irrigations, climatotherapy or vaccines are useless. Lung resections should be performed in a two or three-stage operation. The several stage operation of the rib resection type has been attended, in the author's experience, with a 20 per cent. mortality. The operation of intercostal lobectomy has distinct technical advantages. When performed in one stage, an undue risk of life is incurred. The physiologic advantages of the several stage technic may yet be successfully combined with the technical advantages of the intercostal exposure.

86. **Ectopic Pregnancy.**—The conclusions reached by Oastler from observation of these cases would seem to be that all subacute ectopic pregnancies should be operated on at once, removing from the abdomen the tube affected, the fetus, placenta, membranes and blood. All acute cases should be operated on at once except cases in extremis. In these cases it would seem advisable to wait, watching the patient very carefully. If no improvement occurs in a very short time, operate. Two patients of this series bled to death. The ovarian artery had ruptured in both. One was an interstitial pregnancy. As there is no doubt, therefore, that patients can bleed to death, operation must not be delayed too long in waiting for a reaction in these extreme cases. The abdominal route was chosen in all these cases and it is undoubtedly the only safe procedure to follow. Inasmuch as there were no cases extending to the viability of the child in the series, there will be no discussion of the treatment in this condition.

88. **Continuous Drainage for Empyema.**—Philips has devised a special cannula which is practically nonobstructible, with which one can drain the pleura, through an intercostal space, into an air-tight receptacle. Special provision is made for the attachment of a suction pump and a negative pressure manometer. This makes it possible to maintain any desired negative pressure in the pleural sac while draining it.

90. **New Intramedullary Bone Transplant.**—The original feature of this operation is the method of cutting the graft at a distance of about 1 inch from the fracture, so as to leave a complete ring of bone at the fracture end. The splint is pressed down into the medullary canal and driven across the line of fracture, so that half of the splint will be in each fragment.

Vermont Medicine, Rutland

January, II, No. 1

92 Problems in Administration of State Medicine. M. Nicoll, Jr., New York.—p. 1.
93 Case of Strangulated Hernia with Unusual Symptoms. L. H. Ross, Bennington.—p. 7.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

January, XI, No. 1

1 Tuberculosis Movement Under War and After-War Conditions. T. D. Acland, J. Moore and J. Lumsden and Others.—p. 1.
2 Practical Considerations on Conduct of Work at Tuberculosis Dispensary. H. A. Ellis.—p. 13.
3 Tubercle Bacillus. A. H. Miller.—p. 18.
4 After-Care of Consumptive Working Man. P. C. Varrier-Jones.—p. 21.

British Medical Journal, London

January 13, I, No. 2924

5 *Treatment of Burns by Paraffin. A. J. Hull.—p. 37.
6 Early Diagnosis and Treatment of Syphilis. J. H. Sequeira.—p. 38.
7 Diseases of Male Urethra. F. S. Kidd.—p. 41. To be continued.
8 *Treatment of Acute Bacillary Dysentery. J. B. Fisher.—p. 43.
9 *Id. G. A. Finlayson.—p. 46.
10 Importance of Early Prophylactic Injection of Antitetanic Serum in Trench Foot. D. Bruce.—p. 48.

January 20, No. 2925

11 *Flavine and Brilliant Green, Antiseptics Used in Treatment of Infected Wounds. C. H. Browning, R. Gulbransen, E. L. Kennaway and L. H. D. Thornton.—p. 73.
12 *Id. D. Ligat.—p. 78.
13 Diseases of Male Urethra. F. S. Kidd.—p. 79. To be continued.
14 Two Cases of Removal of Foreign Bodies (Metal) from Eye. H. T. Kelsall.—p. 81.
15 Case of Actinomycosis Successfully Treated by Vaccine. C. W. Dean.—p. 82.
16 *Home-Made Bread Substitutes for Diabetic Patients. F. Nicholson.—p. 82.

5. See THE JOURNAL, Feb. 3, 1917, p. 373.

8. **Treatment of Acute Bacillary Dysentery.**—The treatment given these patients by Fisher was dietetic, medicinal and specific. Patients are only allowed albumin water, barley and lemon water for the first forty-eight hours. Coincidentally with the improvement of the general conditions the diet is gradually increased. Milk is not allowed except in the form of pudding or custard. One dram of magnesium sulphate is given three times a day for the first few days, and then, as the stools diminish in frequency and improve in appearance, the amount is gradually reduced. This applies to practically all cases. Rectal lavage with 1:1,000 solution of copper sulphate and mistura simaruba often benefit more chronic cases. Reliance is placed on specific treatment, namely, multivalent antidysenteric serum. Each individual case must be judged on its merits. In the more severe cases Fisher injects 80 c.c. into the flank within a few hours of admission, but generally leaves the milder ones until the following morning, and then may give 40 or 60 c.c. One large dose of serum is sufficient to cure some cases; others, though much improved, require more, and in these, after waiting forty-eight hours, Fisher gives a further 60 or 80 c.c. A few of the worst may need a third or even a fourth dose. Some of the fulminating variety have been given 140 or 160 c.c. intravenously within twenty-four hours of admission. If four doses of 80 c.c. each, spread over a period of six or seven days, have not brought about the desired result, further injections are indicated.

9. **Id.**—Results have convinced Finlayson that 100 c.c. antidysenteric serum should be given intravenously without delay, followed, if considered necessary, by a second dose within twenty-four hours. After one intravenous injection of 100 c.c., subsequent doses may be injected subcutaneously into the axilla, infraclavicular space, or flank. The amount which Finlayson usually gives is 40 c.c. in the morning or evening. In association, a mixture containing 1 dram of magnesium sulphate, 1 dram of sodium sulphate to half an ounce of water, or 1 ounce of mistura alba is administered hourly, or even more frequently, until the motions became pale and watery, containing perhaps a few blood stained shreds; the interval between the doses is then lengthened according to the conditions noted. The diet in the early stage is restricted to albumin water and barley water, with strained chicken tea and meat juices.

11. **Flavine and Brilliant Green in Treatment of Infected Wounds.**—Taking the whole of the authors' results in conjunction, the following points emerge: of all the substances examined, the compound flavine stands out as possessing the highest sum of desirable properties for therapeutic purposes; that is, great antiseptic power, along with relative nontoxicity toward phagocytosis and lack of irritating effect on epithelium. The triphenylmethane compounds, especially brilliant green and crystal violet, are extremely active in the case of cocci, but toward *B. coli* their bactericidal value is considerably lower. On the other hand, flavine is much the most potent, of all substances investigated, toward both groups of organisms. In the case of *B. coli* suspended in serum, flavine is approached only by mercuric chlorid (although the latter is about ten times weaker); but the disadvantage of the mercury salt lies in the serious effect which it has in interfering with phagocytosis. When tested on staphylococci, flavine is about twenty times more powerful than mercury perchlorid, and 800 times more powerful than phenol as a bactericide. Flavine is diaminomethylacridinium chlorid which was originally prepared by Benda at the desire of Ehrlich, and was found to have a very marked therapeutic effect in trypanosome infections. Flavine while of approximately equal antiseptic power to the other acridin compounds, is much less harmful to phagocytosis than the latter. It is also less toxic. It can be administered intravenously, and does not exert toxic action on any special organ. Solutions more concentrated than 1:1,000 should not be administered, however, owing to the danger of causing agglutination of the red blood corpuscles. A 1:1,000 solution (equivalent, on the basis of bactericidal concentration, to an 80 per cent. solution of phenol in the case of staphylococci) has been applied to the surface of wounds without causing pain or local irritation, and the skin has not been harmed by its use. In addition, there have been no local or general toxic effects, even when quantities of the solution have been kept in contact with the tissues for a considerable time, or when injected into the tissues.

The authors especially emphasize the possibilities in the direction of prevention of sepsis, which would be likely to attend the use of flavine or brilliant green in recent wounds applied during that dangerous period between the infliction of the wound and the establishment of an adequate local defensive mechanism. It has become the custom at the outpatient department of the Middlesex Hospital to treat all casualty cases by irrigating with a 1:1,000 solution of flavine, because the conclusion has been justified that a wound so treated will in all probability heal by first intention.

12. **Id.**—Upward of 150 cases have been treated by Ligat with flavine compounds, about 50 per cent. of these being war wounds. In the case of suppurating wounds the procedure followed has been to secure adequate drainage by free incision when necessary, and then to irrigate with a 1:1,000 solution of the antiseptic in normal saline; finally the wound is covered with gauze soaked in the solution, and protective applied to prevent evaporation. In case there has been a cavity it has been packed lightly with gauze soaked in the solution. A considerable diminution in the discharge of pus may be expected at the end of twenty-four hours. In wounds of moderate severity in which no foreign body is present and in which free drainage is secured, the suppurative process may be expected to come to an end after four or five days' treatment. Any difficulty in obtaining free access for the antiseptic to the infected area was overcome so far as possible by syringing the solution into the wound cavity under slight pressure, and in some cases flavine 1:1,000 was injected into the tissues and muscle planes by a cannula; no subsequent damage to the parts was observed. Ligat has used considerable quantities both of brilliant green and flavine over prolonged periods; in some cases injecting the latter antiseptic into the tissues. He has never observed any toxic phenomena following their use.

16. **Home-Made Bread Substitutes for Diabetic Patients.**—Nicholson uses a bread made of peanut flour and casein. It has the advantage of being very nice to the taste, and can be cut readily into slices even as thin white bread. The formula for making it is as follows: peanut flour, 8 ounces; casein, 2 ounces; a pinch of salt; white of eggs, 12 ounces. The white of egg is beaten to a snow, and then the other ingredients (previously lightly mixed) are slowly added. The bread is baked in a sound oven in a tin.

Glasgow Medical Journal

January, LXXXVII, No. 1

17 Residual Urine in Senile Bladder with Special Reference to Conduct of Case so as to Postpone or Avoid Use of Catheter. D. Newman.—p. 1.
18 Operative Treatment of Harelip and Cleft Palate. J. H. Nicoll.—p. 16.
19 Achylia Gastrica; Simple or Benign Achylia. W. MacLennan.—p. 19.

Journal of Tropical Medicine and Hygiene, London

January 1, XX, No. 1

20 Flagellate Frequenting Necks of Bottles. J. W. S. Macfie.—p. 1.

Lancet, London

January 13, I, No. 4872

21 Mechanism of Serum Reactions. H. R. Dean.—p. 45.
22 State Octopus and Medical Profession. E. Cautley.—p. 50.
23 Cases of Cerebrospinal Fever in Royal Navy, August 1, 1915, to July 31, 1916. H. D. Rolleston.—p. 54.
24 *Four Cases of Hemiplegia Caused by Embolism Following Gunshot Wounds of Carotid Arteries. L. Colledge and J. S. Dunn.—p. 57.
25 *Presence of Accessory Bacteria Food Factor in Nasal Secretion. C. Shearer.—p. 59.
26 Cause and Prevention of Trench Foot. C. N. Longridge.—p. 62.
27 Case of Sarcoma of Mediastinum Invading Lung. A. G. M. Grant.—p. 63.
28 Case of Large Omental Cyst in Child. F. C. Pybus.—p. 63.

January 20, No. 4873

29 *Laminectomy in Gunshot Injuries of Spinal Cord; Report of Cases. C. J. Symonds.—p. 93.
30 Gunshot Wounds of Abdomen During Siege of Kut. C. H. Barber.—p. 98.
31 Phenomena of Anaphylaxis. S. Wyard.—p. 105.
32 *Case of Traumatic Rupture of Jejunum; Operation; Recovery. W. S. Handley.—p. 109.

24. **Hemiplegia Caused by Embolism Following Gunshot Wounds of Carotid Arteries.**—In each of the four cases cited by Colledge and Dunn the hemiplegia and cerebral disturbance were caused by occlusion of the middle cerebral artery or its branches. In all four there was thrombus present in the carotid arteries in the neck, consequent on damage of the arterial walls, and in each there were several inches of the internal carotid artery patent between that thrombus and the portion blocking the cerebral vessel. Consequently the authors believe it justifiable to conclude that the blood continued to flow for a time, at least, in the wounded vessels, and that the occlusion of the cerebral arteries occurred by embolism. Similar emboli were found in one instance in the branches of the external carotid also. The damage to the large cervical arteries was in every case considerable. In three there was actual perforation of the wall; in the fourth the trunk was found completely severed, but this, no doubt, occurred secondarily by sloughing, after the vessel was fully thrombosed. Hemorrhage was slight in these cases; in only one of them was ligature necessary. The early appearance and completeness of the hemiplegia and the rapidly fatal issue in these cases—fifteen to seventy-two hours—resemble the effects of ligature of the common carotid.

25. **Accessory Bacteria Food Factor in Nasal Secretion.**—In dealing with numbers of cerebrospinal fever contacts Shearer noticed that the growth of the meningococcus was in some instances strongly influenced by the amount of nasal secretion transferred by the swab to the surface of the culture medium. It was found from experiment that if a trace of dilute sterile nasal secretion was added to the surface of the culture medium, it brought about a rapid growth of the meningococcus when this medium was subsequently inoculated with this germ. The growth is always many times the amount obtained on the same medium, on planting out a similar quantity of culture, in the absence of nasal secretion. Shearer suggests that the action of sterile dilute nasal secretion in accelerating the growth of the meningococcus would seem to be entirely in the nature of an accessory food body or vitamin, as alone this secretion is quite incapable of supporting or stimulating the growth of this germ. This conclusion is supported by its properties. In addition to the meningococcus and its allies, it has been shown to accelerate the growth of the pneumococcus, *B. typhosus, B. coli-communis,* various fecal streptococci and a number of throat bacteria.

29. **Laminectomy in Gunshot Injuries of Spinal Cord.**—Symonds advocates using the old term "trepanning the spine" instead of laminectomy. He reports cases and discusses their treatment.

32. **Traumatic Rupture of Jejunum.**—Handley's patient sustained a complete rupture of the jejunum from an accident, the wheel of an automobile passing over her abdomen 6 inches below the duodenojejunal flexure; the small intestine was found to be torn completely across. An end-to-end anastomosis was done. The incision was closed after washing out the abdomen in every part with a large quantity of saline and introducing a pelvic drainage tube just above the pubes. A considerable quantity of intestinal contents was found to be present in the pelvis. The after-treatment included starvation diet for some days. The patient made a complete and rapid recovery. Solid food was first permitted about a fortnight after the operation. Handley believes the favorable result of the case is largely to be attributed to his abstention from resection.

Annales de Médecine, Paris

November-December, 1916, III, No. 6, pp. 567-677

33 *Idiopathic Dilatation of Bladder or Other Urinary Organs. (La mégavessie et l'hydronéphrose essentielle.) L. Bard (Geneva).—p. 567.
34 *The Urologic Syndrome with Epidemic Cerebrospinal Meningitis. II. (Syndrome urologique de la méningite cérébro-spinale à méningocoque de Weichselbaum.) P. Cazamian.—p. 576.
35 Disturbances in Sweat Secretion with Lesions of Peripheral Nerves from War Wounds. (Les troubles de la sécrétion sudorale dans les lésions des nerfs périphériques, par blessures de guerre.) A. Porak.—p. 596.
36 War Psychoneuroses. II. G. Roussy and J. Lhermitte.—p. 619.

33. **Idiopathic Dilatation of Parts of Urinary Apparatus.**—Bard insists that essential and progressive dilatation of an organ is essentially the same process wherever it occurs, although the symptoms caused by the different organs involved vary so widely. The trouble is some original local subnormal condition rendering it less resistant at this point to the normal pressure which the organ creates or undergoes from the fact of its own physiology. He has published four previous studies of this idiopathic dilatation as affecting the glandular organs, the alimentary canal, and the eyeball, and he here describes three cases in which the urinary apparatus was involved. This idiopathic dilatation, wherever it occurs, is distinguished by the congenital origin, its development without apparent cause, the long tolerance, and the progressive evolution. The recognition of the true cause of the symptoms permits rational treatment, by shutting off the organ if it can be spared and, if not, by checking the further development by relieving the organ from all possible strain. He states, "The polycystic kidney is the manifestation of the trouble when it affects the glomerular-tubuli apparatus, but megabladder, megapelvis, and the more generalized form, cystohydronephrosis, are likewise tangible evidence of this anomaly." He had one patient succumb to uremia from the last mentioned cause, nearly the entire urinary apparatus showing this progressive dilatation with secondary atrophy of the kidneys. Nothing was found, even postmortem, to explain the disturbances otherwise. There was no edema till the last month. The urine then contained from 1 to 3 gm. albumin but no tube-casts. The eye fundus seemed to be normal and the heart was not hypertrophied. Micturition was inclined to be frequent and scanty. His second patient was a man of 48 who succumbed to sudden cerebral hemorrhage after a few weeks of slight albuminuria and symptoms vaguely suggesting a cerebral tumor. The bladder, ureters, pelvis and calices were found at necropsy very much dilated. What was left of the kidney tissue seemed normal, as also the urethra.

The remembrance of these cases enabled him to diagnose this condition in the third patient, a farmer of 56, who for several months had suffered from headache, nausea and visual disturbance with other signs suggesting uremia from chronic epithelial nephritis. Palpation of the abdomen revealed a very large bladder, reaching to the umbilicus, but not causing any discomfort, and there was nothing to suggest bladder or prostate trouble otherwise. Micturition had been abnormally frequent day and night since childhood, but this pollakiuria

had never been regarded as pathologic. The desires were urgent but the amount of urine was small each time. Acute pericarditis soon complicated the clinical picture, and necropsy confirmed the megabladder and the epithelial nephritis, but there was no hydronephrosis, simple stasis from idiopathic dilatation having evidently sufficed to induce the latent retention with advanced uremia, just as occurs with stricture or a prostatic obstacle. Discovery of the megabladder may give the clue to the nature of the kidney trouble, but when the hydronephrosis exists alone, differentiation is difficult. (Bard's study of infantile glaucoma as a manifestation of this tendency to idiopathic dilatations was summarized in these columns, April 8, 1916, p. 1172.)

34. **The Urologic Findings in Epidemic Meningitis.**—Cazamian regards the polyuria in epidemic meningitis as the reflection from a polydipsia of central origin as the disease takes a turn for the better. He continues his study of the subject, reporting here the findings as to specific gravity, reaction, color, aspect and odor, and content in the normal constituents of the urine. The curves of their elimination run closely parallel, rising under the influence of serotherapy as convalescence approaches. Only the urates may show some variability. It is evident, he thinks, that the toxins of the disease, acting on the nerve centers, first check and then stimulate the elimination of these substances, the latter phase being responsible for the "meningitic diabetes," to which Loeper has called attention. Cazamian is now studying the elimination of abnormal constituents of the urine and will report later.

Archives des Maladies du Cœur, etc., Paris

December, 1916, IX, No. 12, pp. 521-589

37 Variations in Size of Heart with Cervical Rheumatism plus Sciatica. (Les variations du volume du cœur dans le syndrome de rhumatisme cervical et de névralgies sciatiques associées.) P. Nobécourt and E. Peyre.—p. 521.

38 *Estimation of Coagulation Time of Blood by Air Bubble on Spirit-Level Principle. (Estimation du temps de coagulation du sang "in vitro" par le procédé de la "bulle d'air.") E. Lenoble —p. 539.

38. **Test for Coagulating Time of the Blood.**—Lenoble's method of estimating the interval before blood coagulates outside of the body is based on the principle of the spirit level, as already described in these pages, Dec. 30, 1916, p. 2039. He here tabulates the findings in 100 different patients. The shortest interval was in a case of meningeal hemorrhage, fifty-five seconds; the longest in a case of purpura in a tuberculous man, six minutes and thirty seconds. Coagulation was complete in a minimum of one minute and thirty seconds (in a case of meningeal hemorrhage); the maximum, eleven minutes, was in a patient with Friedreich's disease with congenital mitral stenosis and congenital cataract. The average period for coagulation was two minutes and forty seconds, the average interval before coagulation was complete was four minutes and thirty seconds. The tube containing the blood and the bubble of air must be moved gently or the forming film is broken. The bubble of air should be about the size of a pin head. He uses for the tube Hayem's hematimeter.

Bulletin de l'Académie de Médecine, Paris

January 2, LXXVII, No. 1, pp. 1-54

39 *Requirement of Nitrogenous Foods in the Diet: The Meat Question. (Besoins de la France en azotés. Question de la viande.) E. Maurel.—p. 42.

40 Malaria in the Wounded from the Eastern Fighting Line. (Paludisme et traumatisme chez les blessés de l'armée d'Orient.) L. Moreau.—p. 48.

41 Injury of the Ear from Explosions. (Les mutilations de l'organe auditif par les détonations. Comment peut-on les guérir?) Wicart.—p. 51.

39. **Requirements of Nitrogenous Foods.**—Maurel reaffirms that while nitrogenous foods are indispensable, yet all the different nitrogenous foods can replace each other, weight by weight. Whether they are of animal or vegetable origin is practically immaterial. The intake of nitrogenous substances should conform to the amount used up and cast off in the vital processes. An excess is as bad, if not worse than a deficit. The average normal requirement is from 1.25 to 1.5 gm. nitrogenous elements in a total of 35 calories per kilogram of the body weight. He cites statistics which show that at Paris and Toulouse, about the largest meat-eating centers in France, during the last few years before the war, the daily amount of meat consumed per capita was 170 and 149 gm., representing only 30 and 27 gm. nitrogen, that is, only about a third of the requisite nitrogen, and only a sixth and an eighth of the calories required. The balance was made up with nitrogenous bodies from vegetables and fruit sources. By drawing on these sources still more, the high cost of living can be materially reduced.

Paris Médical

January 6, VII, No. 1, pp. 1-36

42 *Intravenous Injections of Quinin in Treatment of Primary Malaria. P. Carnot and A. de Kerdrel.—p. 2.

43 *Treatment of Diphtheria Bacilli Carriers. (Le traitement des porteurs de bacilles diphthériques.) M. Labbé and G. Canat.—p. 9.

44 *Sciatica and Sciatic Paralysis Consecutive to Intragluteal Injections of Quinin. J. A. Sicard, L. Rimbaud and H. Roger.—p. 10.

45 *Treatment of Suprarenal Insufficiency. O. Josué.—p. 13.

46 Emetin and Arsenic Combined in Treatment of Amebic Dysentery. P. Ravaut and G. Krolunitsky.—p. 18.

47 Experimental Research on Treatment of Tetanus. J. Camus. —p. 24.

48 *Treatment of Superficial Infectious Processes. (Traitement des dermo-épidermites microbiennes.) H. Gougerot.—p. 28.

42. **Intravenous Injections of Quinin.**—Carnot commends the intravenous route as simple and not at all dangerous, with the customary technic, when it is a question of striking quick and striking hard. The sterilizing effect of the quinin is reenforced by this route, but even this is not effectual against the more resistant forms of the hematozoon, the crescents in particular. Only with series of partial sterilization are we able to cope with rebellious malaria, and periods of complete suspension are advisable to allow a new crop of the parasites to develop which may prove less resistant.

43. **Treatment of Diphtheria Bacilli Carriers.**—Labbé and Canat report very favorable results from insufflation of a powder made from the serum of horses previously injected with diphtheria bacilli killed by heat. This powder was insufflated into each nostril of the diphtheria carriers four times a day. One teaspoonful of the powder in the atomizer bottle serves for thirty insufflations. In parallel series of patients treated this way and with ordinary antiseptic measures no diphtheria bacilli were to be found in thirty-five after an average of twenty-four days with the powder treatment, while the intervals averaged over forty days in the other group. The powder can also be used in tablet form.

44. **Sciatic Paralysis After Intragluteal Injections of Quinin.**—Sicard and his co-workers state that in the last few weeks they have encountered ten cases of extremely painful sensory disturbances in the domain of the sciatic nerve with almost total paralysis of the leg—all the result of intragluteal injections of quinin with defective technic. Five other cases have been under observation for several months; two of them have shown no improvement under a year's treatment. The men of the latest group came from the Saloniki region and the injection had been made by nurses in seven of the cases. Eight of the total fifteen are improving. In several of the cases the reaction of complete degeneracy was pronounced in the muscles tributary to the sciatic nerve. They warn to be guided strictly by the classic directions for such injections and, in case of the slightest doubt, to make the injection in the thigh. For intragluteal injections the patient should be seated. In the sitting position the nerve lies at a point beyond the reach of the needle. They advise to insert the needle above a horizontal line crossing the extreme end of the intragluteal furrow. Any point above this line is safe.

45. **Suprarenal Insufficiency.**—Josué emphasizes that symptoms of suprarenal insufficiency should be sought for in every infectious disease. It may also form a part of the clinical picture in alimentary intoxications, chloroform and salvarsan poisoning, and in heart disease with much enlargement of the heart, the *asystolie surrénale* characterized by hypertrophy of the heart with low blood pressure, weakness, white dermographism and signs of cardiac incompetency. Whatever the accompanying circumstances, suprarenal insuf-

ficiency is always serious, liable to entail even sudden death. Suprarenal treatment may give unhoped-for relief in the severe and malignant forms. The extract of the total gland seems preferable when toxic phenomena predominate, while epinephrin is indicated more for cardiovascular disturbance. The extracts can be given by subcutaneous injection or by the mouth. He advises against the intravenous route unless extra rapid and potent action is necessary.

Suprarenal extracts seem to stimulate the suprarenals to regenerate. Hyperplasia of the suprarenal glands has been noted in rabbits after repeated intravenous injections of epinephrin, and the suprarenals were found relatively large at necropsy of a man with suprarenal asystole and cardiac insufficiency who had long been taking occasional systematic courses of suprarenal treatment. The suprarenal disturbances finally completely subsided, and at necropsy, several months later, the suprarenals weighed together 16.05 gm. Josué regards it as probable that the prolonged suprarenal treatment had actually induced regeneration of these glands. Epinephrin given by mouth has to be in a comparatively large daily dose but fractioned into small doses throughout the day, trying to keep the patient constantly under its influence. This can be long kept up without inconvenience; some of his patients have taken 3 mg. of epinephrin (adrenalin) daily for a month, six weeks or longer, without any disturbance therefrom. In acute cases he prescribes 0.5 c.c. of the 1:1,000 solution in a little water, from two to ten times a day. For subcutaneous injection, his dose is 0.5 c.c. of the 1:1,000 solution, repeating often. Doses of 1 mg. can be kept up for a month or more. These injections are generally painful. Or 1 mg. of the epinephrin can be added to 250 or 500 c.c. of physiologic salt solution. Addition of 0.01 c.c. novocain prevents pain. The slowness with which this is absorbed is an advantage.

In acute infectious disease, suprarenal treatment may ward off trouble. In typhoid, for instance, when the pulse grows rapid and weak, from 2 to 4 mg. of epinephrin, fractioned into four or eight doses, may ward off mishaps. When toxic phenomena are pronounced, as in diphtheria, he gives the total extract by the mouth and injects the epinephrin-novocain solution subcutaneously. Carnot has reported good results in pernicious malaria from subcutaneous injections of the epinephrin-novocain saline, supplemented by intravenous injection of quinin. This technic proved effectual without offering the dangers of intravenous epinephrin treatment.

48. **Microbian Dermo-Epidermitis.**—Gougerot has coined this term to denote the extensive infectious processes in the skin, especially the epidermis, which are so common among the soldiers now, and so liable to run a chronic course if eczema or trophic disturbances or other causes interfere with the early healing. He says that painting the skin with a 1:50 or 1:10 solution of silver nitrate is the best antiseptic and cauterizer, promoting healing and preventing itching, and it should be applied in all cases. Rest in bed, the foot on a higher plane than the inguinal region, the foot and toes exercised, with light massage, are important adjuvants. He gives a number of formulas for mercurial pastes, graduated for the serous, the oozing and the eczema-like cases. Pastes are better than salves, and oils or creams are better than petrolatum.

Presse Médicale, Paris

December 28, 1916, XXIV, No. 72, pp. 601-608

49 *Treatment of Tuberculous Pericarditis with Effusion by Insufflation of Air. P. E. Weil and Loiseleur.—p. 601.
50 Treatment of Chronic Pleural Empyema. (Traitement des fistules pleurales.) V. Pauchet.—p. 604.
51 Self-Feeding Irrigator for Carrel-Dakin Method of Treating Wounds. T. Tuffier.—p. 608.

49. **Insufflation of Air in Treatment of Tuberculous Pericarditis.**—Letting air into the pleura to take the place of the effusion has much simplified the treatment of pleurisy. It is possible by this means to release as much as 3 or 4 liters of effusion and replace it with air at one sitting. The air counteracts reproduction of the effusion and attenuates the tuberculous process, transforming a hemorrhagic or seropurulent into a merely serous effusion. Weil and Loiseleur have been applying this same technic in treatment of pericarditis, and have obtained such favorable results that they commend for general adoption this method of treating tuberculous pericarditis with effusion. The effect was the production of a pneumopericardium and hydropericardium, which can be watched and followed with the Roentgen rays. The latter permits paracentesis with an ease and precision hitherto unknown. They found it necessary to complete the withdrawal of the effusion before injecting the air. They used ordinary air without special filtration and found the benefit even more striking than in pleurisy. In the case of a child of 14, the procedure was repeated five times. The intervals were eight, fifteen, thirty-three and forty-eight days, demonstrating the progressive improvement. They compare the action of this pneumopericardium with that of induced pneumothorax, the principle and effect being practically the same. The patient recovers without symphysis, preexisting adhesions being generally broken up under the pressure of the air. Operative measures are superfluous, but benefit was derived from exposure of the abdomen and trunk to the direct sunlight, beginning with five-minute exposures and lengthening them to a maximum of forty minutes a day. The injection of the air in an amount equal to that of the fluid tapped, caused no pain nor dyspnea nor heart symptoms in the cases described. Only once was there a convulsive cough; the child had long been subject to this cough and the injection of air transiently aggravated the tendency on this occasion. Several roentgenograms show the exact findings.

Berliner klinische Wochenschrift

December 4, 1916, LIII, No. 49, pp. 1309-1332

52 *Successful Removal of Spinal Tumor; Two Cases. (Ueber erfolgreiche Geschwulstoperationen am Hals- und Lendenmark.) H. Oppenheim, E. Unger and E. Heymann.—p. 1309.
53 No Evidence of Infectious Origin in Fifteen Cases of Acute War Nephritis. (Aetiologie der Kriegsnephritis.) H. Beitzke and Seitz.—p. 1313.
54 *Retention of Nitrogenous Waste in Body Fluids in Nephritis. (Ueber stickstoffhaltige Retentionsstoffe im Blut und in anderen Körperflüssigkeiten bei Nephritikern.) M. Rosenberg.—p. 1314.
55 *Tests for Albuminoid Bodies in the Air. (Lufthygienische Untersuchungen. Nachweis von eiweissartigen Körpern in verbrauchter Luft.) W. Weichardt and K. Wiener.—p. 1316.
56 Control Roentgen Examination of the Heart. (Apparat für Kontrollaufnahmen des Herzens.) W. Preminger.—p. 1319.
57 Clinical Significance of Irregularity of Heart Action. (Die klinische Bedeutung der Unregelmässigkeiten der Herztätigkeit.) P. Schrumpf.—p. 1320.

December 11, No. 50, pp. 1333-1356

58 *Treatment of War Neuroses. (Neue Methoden und Gesichtspunkte zur Behandlung der Kriegsneurosen.) L. Mann.—p. 1333.
59 *Laws Regulating Growth and Nutrition in Man. (Ueber die Wachstums- und Ernährungsgesetze des Menschen.) P. Riebesell.—p. 1338.
60 Serous Periostitis Following Trauma. O. Heinemann.—p. 1339.
61 Apparently Favorable Influence on the Teeth of War Diet. (Zahnkrankheiten und Kriegsernährung.) Schaefer.—p. 1339.
62 Fracture of Exostosis on Lower Epiphysis of Femur. L. Meyer.—p. 1340.
63 Pathologic Chemistry and Metabolism in Rachitis. E. Schloss.—p. 1340.

52. **Spinal Cord Tumors.**—Oppenheim's first patient was a woman of 36 who recuperated practically completely after removal of a fibroma 10.5 cm. long, extending along the spinal cord over the entire cervical region. The findings in the cerebrospinal fluid aided in the diagnosis, but in two other cases of the same kind the fluid was normal. The case is the most striking one of which he knows to date, demonstrating the amount of compression which the cervical spinal cord can stand without irreparable injury. In the second case, a myxolipoma was removed at the upper lumbar and lower thoracic vertebrae. This patient was a girl of 16 whose complaints of abdominal pain had led to a useless appendicectomy a year before. The Roentgen and blood findings were normal, but the pains kept increasing and spread through the abdomem, lumbar region and left leg. They were regarded as imaginary for a long time, but finally the girl was treated with extension for eight weeks. It gave transient relief but then the pains grew worse, intensified by sneezing, coughing or laughing, and finally the left leg showed signs of weakness, with some paresis and atrophy of the left quadriceps, and

absent knee jerk, while slight clonus of the foot could be elicited. On this basis the tumor of the lumbar spinal cord was diagnosed and successfully removed. Reexamination several months later showed completely normal conditions except for slight weakness in lifting the left leg, slightly interfering with climbing stairs or a hill.

In conclusion he mentions some cases of chronic myelitis in which the symptoms deceptively simulated those of a tumor. Laminectomy in such cases is only exploratory and may whip up the disease. In another case a small tumor was correctly diagnosed and removed but the patient succumbed to weak heart action a few hours later. The pulse had been somewhat accelerated but not enough to warn of imminent danger. In another case an obese woman of 65 with exophthalmic goiter presented symptoms of spinal-cord tumor but the sanatorium physician mistook them for hysteria and insisted on exercise. He also burnt the patient during electrotherapy as her loss of sensation in the skin was not recognized. A consultant diagnosed osteomalacia. Oppenheim traced the symptoms to a tumor compressing the spinal cord. It was easily removed but proved to be malignant, and the patient soon succumbed to weakness of the heart. Even allowing for all such mishaps, tumors compressing the spinal cord seem to be one of the most grateful fields of medical-surgical endeavor.

54. **Retention of Nitrogenous Waste in the Various Body Fluids.**—Rosenberg tabulates the findings in regard to urea, creatinin and indican in the blood and ascitic fluid or pleural effusion in twenty-eight cases of various morbid conditions with ascites and in twenty-two with pleural effusion. When there was azotemia, the urea content of the effusion in the pleura or peritoneum was from 80 to 100 per cent. that of the serum. The creatinin content was up to 20 per cent. higher than that of the blood, while the indican content paralleled that of the blood. In a third table the findings in the blood and cerebrospinal fluid are compared. The latter contained from 56 to 96 per cent. as much urea as the blood, but only from 37 to 75 per cent. creatinin. He never found indican in the cerebrospinal fluid even with the highest indicanemia.

55. **Albuminoid Bodies in Expired Air.**—A man blew through a cotton-stoppered, crook-shaped tube into a wash-bottle containing 3 c.c. distilled water. The water was then rapidly evaporated and chemical tests applied to the residue. From this and other tests described, the presence of albuminoid bodies in the expired air was unmistakably established. The amount averaged 0.000015 mg. for each inspiration during quiet breathing, representing a total of 0.05 mg. for the twenty-four hours. The proportion during speaking averaged 0.07 mg. for the twenty-four hours. Analyses of the findings showed a content of 0.02 mg. amino-nitrogen in the air blown into the tube during twenty-four hours. Tests in telephone cabinets showed marked enrichment of the air, but they also showed that the air seems to spontaneously cleanse itself. About 2,200 liters air in a telephone cabinet were aspirated through a wash-bottle twelve hours after termination of the other tests. The findings then were practically nil, demonstrating a self-cleansing process.

58. **War Neuroses.**—Mann analyzes the various methods of treatment of war neuroses and describes some of his own successful cases. The hysteric manifestations in these war neuroses are the consequence of some powerful emotion which has induced, as he says, "a physopsychic concussion." The principle of treatment for certain cases is to induce some violent new commotion which will crowd the former one to one side. A pile of iron filings can be partially separated by shaking the paper holding them, and then they can be reassembled in a pile by shaking again. Kaufmann has been remarkably successful with his *Ueberrumpelung* method, combining startling electric measures with suggestion and exercise, the orders all in a crisp military tone, and keeping up the sitting until the man is cured, even if it takes two hours or more. Mann has succeeded with somewhat milder means; in some cases with several months of rest alone. No one method can apply to all.

59. **Laws of Growth and Nourishment.**—Riebesell qualifies Wamser's laws as great progress. He seems to have established that the growth—the increase in weight in a given period—is inversely proportional to the gross weight (*Rohgewicht*), and that growth occurs more rapidly the more remote the end of the period of development. He expresses this by formulas and Riebesell deduces from them and the individual proportions a set of figures representing the food requirements at different ages and weights.

Correspondenz-Blatt für Schweizer Aerzte, Basel

December 23, 1916, XLVI, No. 52, pp. 1729-1760

64 The Quantitative Determination of the Physiologic Variables. C. de Montet.—p. 1729. Concluded in No. 53, p. 1761.

65 Fatal Cumulative Toxic Action of Prolonged Use of Veronal.—R. Schubiger.—p. 1741.

December 30, No. 53, pp. 1761-1792

66 Extract of Blood Platelets Injected to Aid the Filling Up of Hole Left by Resection of a Fibrosarcoma of the Femur. A. Fonio.—1772.

Medizinische Klinik, Berlin

December 10, 1916, XII, No. 50, pp. 1303-1328

67 Injury of Internal Organs from Contusions. (Die Kontusionsverletzungen innerer Organe.) A. Dietrich.—p. 1303.

68 Dysentery with Lamblia. (Choleraähnliche Brechruhr mit Lamblien.) R. Müller.—p. 1307.

69 Mechanical Hyperexcitability of Muscles. (Ueber das Muskelphänomen der Soldaten im Felde und seine Stellung zum idiomuskulären Muskelwulst.) E. Mayerhofer.—p. 1308.

70 *Sausage Poisoning. (Ueber Botulismus.) Schede.—p. 1309.

71 Modification of the Hemolytic Factors in the Blood Serum of Syphilitics. (Ueber die Veränderung der hämolytischen Komponenten, bes. des Komplements im Blutserum der Syphilitiker.) V. Kafka and E. Haas.—p. 1312.

72 Interrupted Biologic Method of Purification of Drinking Water. (Der biologische Klärprozess.) W. Gemünd.—p. 1314.

70. **Sausage Poisoning.**—Schede describes an attack of botulism (*botulus* is Latin for "sausage,") in a family of five members who ate from a raw ham. The pig had been slaughtered on the farm six months before. About eighteen hours afterward the symptoms of botulism became apparent in the mother and two boys of 10 and 12, and the woman and the older boy died; the other recovered. The father who had eaten most freely of the ham was not affected by the poisoning. The only gastro-intestinal disturbances were nausea and vomiting which the older boy suppressed. Extreme prostration, dryness of the mucous membrane, difficulty in swallowing and in speaking, diplopia, ptosis, absence of the knee-jerk, paresis of the bladder sphincter, and other symptoms indicating severe involvement of the motor and secretory regions in the medulla oblongata were the more striking manifestations until the respiration center began to suffer. The two who died succumbed to arrest of respiration. Diphtheria antitoxin was given in two of the cases but without result; an antibotulism serum has been made, but it could not be procured for these cases. Pilocarpin has been recommended to combat the dryness of the mucous membranes, and Schede tried it in two cases but obtained alarming results as it induced such profuse secretion of mucus in the air passages. He gave 0.01 gm. subcutaneously but the boy nearly suffocated from the profuse secretion that followed in the air passages, which he was unable to cough up. With oxygen, heart and vessel tonics, and lowering the head, he was tided past this mishap. The tenacious constipation was combated with enemas, as drug purgatives might prove dangerous if they should be long retained owing to the vagus paralysis inducing the obstipation. Bürger advocates lavage of the stomach, even when the intoxication has been long under way. On account of the paralysis of the stomach, scraps of the poisonous food may be washed out with the lavage days afterward. Emetics are liable to do harm on account of the paralysis of the swallowing muscles and loss of reflexes. Ample nourishment should be provided; it is best given through a stomach tube. Oxygen was found a great relief by one of Schede's patients. Schneidemühl commends potassium iodid on account of its efficacy in a certain paralytic affection in cattle. Schede gave it to the boy that recovered, and he says that it is certainly worth a trial in every case of sausage poisoning. He mentions parenthetically that the *Bacillus botulinus* finds favorable conditions for its proliferation not only in ham and sausage but also in canned beans, in herrings and the like. He adds that canned goods should be cooked again before serving.

Münchener medizinische Wochenschrift, Munich

December 5, 1916, LXIII, No. 49, pp. 1717-1748

73 *Syphilis and Tabes from the Ophthalmologic Standpoint. L. Heine. —p. 1717.
74 Improved Tube for Deep Roentgen Work. (Die geerdete Röntgenröhre, eine Spezialröhre für Tiefenbestrahlung.) H. Wintz. —p. 1719.
75 *Rectal Gonorrhea in Children. G. Stümpke.—p. 1720.
76 *Treatment of Hard Edema. A. Nagy.—p. 1721.
77 The Pituitary Body as Regulator of Diuresis and of Specific Gravity of the Urine. H. Bab.—p. 1721. Continuation.
78 Marriage and Descendants of Those who were Backward or Defective Children. (Hilfsschule, Ehe und Nachkommenschaft.) B. Laquer.—p. 1723.
79 Bacillary Dysentery. (Zur Klinik der Bazillenruhr.) W. v. Starck.—p. 1733.
80 Treatment of Abscess in the Brain. (Behandlung der Hirnabszesse mit bes. Berücksichtigung des Hirnödems.) R. Klapp. —p. 1734.
81 Findings with Abdominal Wounds. (Ueber Befunde bei intra- und retroperitonealen Darmverletzungen.) R. Lenk.—p. 1735.
82 Splint Dressing for First Aid to Fractured Femur. (Schienenverband zur Versorgung der Oberschenkelschussfrakturen in der vorderen Linie.) v. Stubenrauch.—p. 1735.
83 Apparatus for Treatment of Contracture. (Zur Dauerapparatbehandlung von Nervenverletzungen.) O. Stracker.—p. 1738.
84 Plaster Casts with Hackenbruch's Portable Extension Devices. (Ueber die Behandlung der einfachen und Schussknochenbrüche mit Hackenbruchschen Distraktionsklammern.) Frick.—p. 1739.
85 Hypertonic Saline in Treatment of Atony of Vessels. (Behandlung der Gefässatonie mit hypertonischer physiologischer Salzlösung.) F. Hercher.—p. 1740.
86 Giant Magnet Part of Field Roentgen Equipment. (Ein Behelfsriesenmagnet in Verbindung mit dem Feldröntgenwagen.) Bartels. —p. 1742.
87 Bandage to Overcome Paralysis of Serratus Muscle. Neumeister. —p. 1743.
88 Improvised Medicomechanical Apparatus. J. Fuchs.—p. 1744.
89 Draining the Trenches and Shelters. (Zur Hygiene des Stellungskrieges. I. Hygiene des Unterstandes.) K. Hannemann.—p. 1745. (Einige praktische Erfahrungen bei Sanitätsunterständen.) Güth.—p. 1746.
90 Contaminated Catgut. (Kriegskatgut.) Burgkhardt.—p. 1747.

73. **Syphilis and Tabes from Ophthalmologic Standpoint.**—Heine reviews what has been written on this subject, saying that the frequency of eye troubles in syphilis can be estimated better by the statistics from general hospitals, etc., rather than from ophthalmologists' records. In the Kiel eye clinic the optic nerve was affected in two thirds of fifty syphilitics, and there were also pupil disturbances in two-thirds, while in half the cases there were disturbances in the external ocular muscles. Choked disk, optic neuritis and neuritic atrophy speak for syphilis rather than tabes. Uhthoff's report on 100 cases of cerebral syphilis stated that simple atrophy of the optic nerve was found in 10 or 15 per cent. of all cases of tabes, but was rare in syphilis.

75. **Rectal Gonorrhea in Children.**—Stümpke has had eighty-eight little girls with gonorrhea in his service at Hanover-Linden, including seven infants. Since 1913 rectal gonorrhea has been found in 55.9 per cent. of the fifty-nine examined. The rectal involvement is extremely difficult to cure; in a number of cases the findings in the rectum were still positive months after the vagina and urethra had been restored to normal. In a few cases the positive findings at first were followed by constantly negative, suggesting accidental or casual contamination. The only manifestations of gonorrheal processes in the rectum are swelling of the extremely red mucosa at the point affected. No tendency to ulceration was ever noted.

76. **Hard Edema.**—Nagy reports a case which illustrates how lymph can become extravasated and cause disturbances like those of a hematoma. Also how prompt benefit follows incision into the fascia and ligaments, supplemented by elastic compression when the painful stage is past.

Wiener klinische Wochenschrift, Vienna

November 23, 1916, XXIX, No. 47, pp. 1483-1514

91 *Causes and Treatment of Bladder Incontinence and Enuresis Nocturna in Soldiers. A. Fuchs and S. Gross.—p. 1483.
92 Prognosis of Abdominal Wounds. (Zur Prognose der Schussverletzungen der Baucheingeweide.) P. R. von Walzel.—p. 1487.
93 Hexamethylenamin in Treatment of Malaria. (Urotropin als Malariaheilmittel.) S. Plaschkes and M. Benkovic.—p. 1495.
94 Syphilitic Disease of the Aorta. L. v. Korczynski.—p. 1498. Continuation.
95 Treatment of War Fractures of Long Bones. (Zur Behandlung der Schussbrüche langer Knochen im Reservespital des Hinterlandes.) F. Burian.—p. 1511.

November 30, No. 48, pp. 1515-1546

96 *Diagnosis and Treatment of Malaria. W. Zweig and J. Matko. —p. 1516.
97 Experiences with Gas Gangrene. (Gasbrand.) H. H. Heidler. —p. 1522.
98 Modified Nail Extension. (Erfahrungen mit der Klammerextension nach Schmerz.) W. v. Sacken.—p. 1527.
99 Case of Progressive Spinal Atrophy of Muscles. P. Leitner.—p. 1529.
100 Acute Typhoid Urethritis. J. Saphier.—p. 1530.
101 *Enrichment of Urine with Bile for Bacteriologic Examination. (Ueber Gallenanreicherung von Urin.) A. Trawinski.—p. 1531.
102 Lead Poisoning from Painted Boards Used as Firewood. (Eine toxikologische Mitteilung.) L. Stefanowicz.—p. 1531.
103 Syphilitic Disease of the Aorta. L. v. Korczynski.—p. 1532. Continuation.
104 Treatment of Gastritis in Soldiers. (Ueber die im Felde vorkommenden Magenerkrankungen, ihre Behandlung und militärärztliche Begutachtung.) T. Frankl.—p. 1543.

91. **Treatment of Incontinence of Urine and Enuresis.**—Fuchs and Gross comment on the remarkable frequency of incontinence of urine among the soldiers on active duty. A history of trauma, getting chilled, or infectious disease was found in every case, and examination of the bladder showed that the body was in a state of maximal contracture. The sphincter region seemed to be normal. It was impossible to inject more than a small amount of fluid into the bladder; anything beyond this caused much pain. These and other facts observed suggested that local heat might relieve the contracture and this was confirmed by experience. Prompt relief followed and the incontinence was conquered by rinsing out the bladder with warmer and warmer fluids, reaching a temperature of from 45 to 48 C. The idea that paralysis of the bladder is always responsible for incontinence thus has to be abandoned. Under the influence of the hot irrigation the contracted musculature relaxes and the incontinence is cured. The incontinence has not returned in any of the cases during the months since this simple measure proved effectual. They suggest a trial of it in tabetic incontinence or with other spinal processes. In the ten cases of incontinence after trauma a complete cure was realized in six and great improvement in three; two were cured and four improved in the eight cases traceable to getting chilled, and four cured and two much improved in ten cases of incontinence following cholera, typhoid or other infectious disease. In five cases of pollakiuria with relative incontinence a complete cure was speedily realized in all. They injected from fifteen to twenty syringefuls at one sitting, repeating the fifteen or twenty minute sitting daily. The incontinence was of less than four weeks' standing in all, and the success was more constant in the more recent cases. Enuresis nocturna seems to be due to some congenital disturbance in the innervation, some insufficiency of the lower segments of the spinal cord, and the hot rinsing of the bladder has no effect on it.

96. **Malaria in Austrian Army.**—Zweig and Matko state that as the war has taken the troops into various malarial regions, the number of cases of malaria is constantly increasing. Quinin prophylaxis has not proved as effectual as had been hoped. In the Italian army, the drop from 50 per thousand cases of malaria in 1900 to 5 per thousand in 1910 is attributed to the systematic quinin prophylaxis. In the Austrian army it was not applied early enough and the technic may have been imperfect. When malaria is once installed, a course of quinin treatment for at least two months is necessary. Even the slightest temperature above normal is a warning that the malaria has not been conquered. Measures to bring on an attack, hoping thus to disclose the latent carriers, were always unsuccessful. The only safe way is to treat all for two months as if certain they are carriers. In nine of their recent 100 cases, after a single severe attack there were no further symptoms, although no treatment had been applied. These persons must have had natural defensive bodies which conquered the infection at the start.

101. **Bile Enrichment of Urine.**—Trawinski tabulates his findings showing that positive findings were obtained in 50 per cent. more of the tests when bile was mixed with the

urine. Of the 421 speciments of urine, pathogenic germs were found in over 22 per cent. but this proportion rose to over 33 when 15 c.c. of beef gall was added to each 3 c.c. of urine.

Pediatria, Naples

December, 1916, XXIV, No. 12, pp. 705-748

105 Formation of the Giant Cells of the Glomeruli in Tuberculosis of the Kidney. A. Filia.—p. 705.
106 *Influence of Antimony on the Fever Curve in Internal Leishmaniasis. R. K.-Marinucci.—p. 717.
107 *Serum Reactions in Cerebrospinal Meningitis. B. Romano.—p. 728.
108 Inflammation of Sublingual Gland as Sole Appreciable Local Manifestation of Mumps. (Caso di sublinguite pura da orecchioni.) E. Modigliano.—p. 733.

106. **Antimony in Internal Leishmaniasis.**—Marinucci describes two typical cases out of more extensive experience to show the effect on the fever curve of intravenous injection of antimony and potassium tartrate. The children were 2 and 4 years old and had been having irregular fever for nine and four months, with pallor, loss of weight and protuberant abdomen. This drug intravenously, and sodium acetyl p.-aminophenyl tartrate subcutaneously seem to act by their chemical action, destroying the parasites like the natural process from production of antibodies. These drugs also have a hemolyzing action but this is secondary, although it can be traced in the fever curve.

107. **Serum Reactions in Epidemic Meningitis.**—Romano gives tabulated details of his tests. The deviation of complement with serum and cerebrospinal fluid was inconstant, but occurred more frequently after the sixth day of the disease, while the Vincent and Bellot test with the cerebrospinal fluid gave positive findings earlier, sometimes the first day of the disease. In the six cases tabulated it was positive in four, and these were at the third to the seventh day of the disease.

Policlinico, Rome

January 1, XXIV, No. 1, pp. 1-40

109 The Spirocheta Pallida in Central Nervous System of Fetus at Term of Mother with Paralytic Dementia. A. Giannelli.—p. 3.
110 Lessons as to Management of the Sick and Wounded Learned as the War Has Progressed. (Insegnamenti della guerra sui servizi sanitari campali.) G. Mendes.—p. 5.

Brazil-Medico, Rio de Janeiro

December 16, 1916, XXX, No. 51, pp. 401-408

111 Contradictory Facts in Antitoxin Treatment of Diphtheria. O. Clark.—p. 401. Continuation.
112 Roentgen Treatment of Uterine Fibromyomas. J. de T. Dodsworth.—p. 404.

Siglo Medico, Madrid

December 23, 1916, LXIII, No. 3289, pp. 817-832

113 Intermittent Hysteric Tremor. (Temblor histerico intermitente de paroxismos periodicos.) E. F. Sanz.—p. 818.
114 Relations between Croup and Pneumonia in Children. (Relaciones entre el crup y la bronconeumonia en los niños.) E. Suñer y Ordonez.—p. 829. To be continued.

Russkiy Vrach, Petrograd

1916, XV, No. 43, pp. 1009-1032

115 Traumatic Aneurysms; Nature and Treatment. A. P. Krimoff.—p. 1009.
116 *Practical Suggestions in regard to Salicylic Medication. (Nieskolko prakt. zamiechanii po voprosu o primienenii salitsilovago natra i salitsilovoi k-ti.) V. L. Yanovsky.—p. 1011.
117 Principle for Continuous Traction of Semiflexed Leg. (O polusognutom polozhenii nizhnoi konechtosti pri primienenii postoyanago vityazheniya.) K. T. Vegner.—p. 1014.
118 Treatment of Fracture of the Femur According to the Russian and Foreign Literature Compared with Results in Sixty-Seven Personal Cases. (O liechenii perelomov bedrenoi kosti.) M. L. Nobel-Oleinikova.—p. 1017. Concluded.
119 Cooperation of National and Local Medical and Sanitary Forces to Promote Public Health Matters. V. I. Gondzikevich.—p. 1026. Concluded.

116. **Salicylic Medication.**—Yanovsky expatiates on the importance of giving the exactly proper dose of any drug we are using. Any excess is liable to have a toxic action and counteract the therapeutic influence, while with too small a dose we not only deprive the organism of the aid it is in our power to bestow, but the drug in small amounts may have some unanticipated action. Too many administer drugs in rather haphazard fashion, not appreciating the importance of exact individual dosage. Yanovsky discusses here salicylic medication, saying that the proper dose of sodium salicylate in all cases of articular rheumatism and in severe muscular and tendon rheumatism is from 2.5 to 4 or 5 gm. in the twenty-four hours. If this does not bring improvement in three days, he changes to pure salicylic acid treatment, giving 0.6 gm. four times a day. By these means he has treated not less than 200 patients with rheumatism, and they proved effectual in all but three or four, although many of the cases in soldiers were exceptionally serious. He reports a few typical cases of acute rebellious and recurring articular rheumatism and of persisting endocarditis to illustrate the prompt efficacy of the salicylic acid alone or after failure of other methods of salicylic medication. In the most serious cases he supplemented the four powders of 0.6 gm. salicylic acid during the day with 0.4 gm. acetylsalicylic acid.

The fear of injurious action on the heart has no foundation in fact; it is a traditional survival of the unfortunate experiences with the salicylates when they were first introduced, many years ago, and they were given in enormous doses and for all kinds of troubles. In reference to any injurious action on the kidneys, he cites some recent experiences with epidemics, especially one hospital epidemic of infectious sore throat in which there was a complicating hemorrhagic nephritis. This occurred just as regularly in those who had not been given salicylic medication as in those who had. He found that pure salicylic acid is no more liable to induce disturbances in the digestive tract than any of its preparations, while it is more effectual and more reliable. He begins with this and then, as the patient improves, he changes to sodium salicylate. For endocarditis he gives 1 or 1.5 gm. during the twenty-four hours. In conclusion he commends for local application Bourget's salve as effectual and nonirritating although it contains 25 per cent. salicylic acid. The formula is 12.5 parts salicylic acid; 8 parts turpentine and 42 parts lard. It is inexpensive and colorless, rubs in easily, and does not turn rancid.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

December 9, 1916, II, No. 24, pp. 2061-2132

120 *The Work of the Railroad Physician. (De positie van den spoorwegarts.) L. W. H. T. Willink.—p. 2064.
121 *Goiter in the Netherlands. (Over het voorkomen van struma.) B. D. G. Kappenburg.—p. 2079.
122 *Local Anesthesia for Children. (Plaatselijke gevoelloosmaking bij kinderen.) E. H. La Chapelle.—p. 2085.

120. **The Railroad Physician.**—Willink's article was the opening address at the recent conference of the organized medical officials of the railroads of the Netherlands. He discussed in turn the three aspects of the work of the railroad physician: as clinician and surgeon; in certifying to the fitness of applicants for positions; and as the confidential adviser of the railroad company. Improvement in contract conditions was one of the main objects of the conference, and Willink remarked that there was great room for improvement. But he rejects the principle of free choice of a physician for railroad employees, mentioning a number of reasons why it is unwise under these circumstances. Among them he notes that it would be impossible to give free passes on the railroad to all outside physicians, while ample facilities for reaching the sick employees are indispensable. Another reason is that the contract physician feels his responsibility to the company, and when he finds a block-signal man, for instance, suffering from overwork and nervousness, he not only orders him to take a vacation and rest, but he telephones the man higher up to ensure that his directions are enforced.

121. **Goiter in the Netherlands.**—Kappenburg recently reported that a goiter was manifest in 11 per cent. of 493 nurses or attendants at the public hospital of Utrecht. Recruiting officers have also called attention to the prevalence of goiter among recruits from Utrecht. Examination of other nurses elsewhere revealed a total of 95 with goiter out of 611, that is, nearly 16 per cent. A tabulation of their home towns shows anew the prevalence of goiter in those from the

Utrecht district, with Amsterdam a close second. But in two other river districts the proportion was still higher, namely, 6:⅘ and 9:2⅝ nurses with and without enlarged thyroids. The figures show further a preponderance of goiter in the nurses who have served in the care of the insane. Does this tend to induce goiter, he asks, or are nurses with a predisposition to goiter attracted more to the care of the mentally diseased?

122. **Local Anesthesia for Children.**—La Chapelle reviews his experience with various operations done on children under 7 with local anesthesia alone. The list includes 9 herniotomies on children under 4. There were no mishaps or drawbacks, and no restlessness except at the first prick of the needle, and this was no more than is observed at the outset of general anesthesia. On the whole, his impression is that local anesthesia is about as applicable to children as to adults. Even with the latter it is advisable to divert the attention from the operation. The advantages of avoiding general anesthesia are likewise the same as for adults. He mentions in proof of this that one boy of 10 whose appendix was removed under local anesthesia had an infant brother, apparently healthy, who died a few hours after a small nevus on the forehead had been excised under general anesthesia.

Hospitalstidende, Copenhagen

December 13, 1916, LIX, No. 50, 1205-1228

123 *Experimental Research on Suture of a Bronchus and Drainage of the Pleura. (Experimentelle Studier over Bronchiesutur og Pleuradrainage.) F. Nielsen.—p. 1205. Commenced in No. 49, p. 1181.

December 20, No. 51, pp. 1229-1252

124 *Day Urine and Night Urine. (Dag- og Naturin.) K. Jespersen.—p. 1229.

December 27, No. 52, pp. 1253-1276

125 Two Cases of Progressive Wasting Away of Fat Tissue. (To Tilfælde af Lipodystrophia progressiva.) A. V. Neel.—p. 1253.

123. **Suture of Bronchus and Drainage of the Pleura.**—The work was done on twenty-four dogs, as is related in detail. The device with which the pleura was drained is also illustrated and its advantages over other methods for the purpose are emphasized. It can be applied and removed without an anesthetic while it permits the wearer to be up and about.

124. **Day Urine and Night Urine.**—Jespersen's study of this subject fills twenty pages and reproduces seven typical charts showing the findings over periods up to nine days. They show that less urine is secreted at night than during the day, but the specific gravity is higher at night as also the percentage of nitrogen. The relative and absolute proportion of sodium chlorid is less at night, as also the absolute nitrogen content of the urine, while the relative proportion is higher at night than in the daytime.

Hygiea, Stockholm

December 31, 1916, LXXVIII, No. 24, pp. 1809-1916

126 *Tubercle Bacilli in the Feces of Children with Tuberculosis of the Air Passages. (Bidrag till frågan om det diagnostiska värdet av påvisandet av tuberkelbaciller i fæces hos barn med tuberkulos i respirationstractus.) J. Leffler.—p. 1809.

127 Complications with Incarcerated Hernia; Three Cases. (Tre sällsynta fall av Hernia incarcerata.) G. Gussander.—p. 1831.

126. **Tubercle Bacilli in Children's Stools.**—Leffler analyzes the scanty literature on the finding of tubercle bacilli in the stools of children with a tuberculous process in the air passages. He examined 110 children at the municipal tuberculosis sanatorium and found tubercle bacilli in the stools in 16.4 per cent. The feces were examined with the Reh ether technic and also with the Engleson method, the former proving most reliable. The cases are tabulated for comparison of the clinical data, and a brief summary of each of the positive cases is given, including four infants and five children over 12 and three respectively 6, 8 and 9, all with advanced physical changes and bad general condition. Others with positive findings were three older children with similar advanced lesions but the general condition still good, and four with minor lesions and good general condition. Five of the older children with advanced lesions had tubercle bacilli in the sputum, and one had considerable expectoration but no tubercle bacilli. None of the other children expectorated. The tables show thus that the conditions in older children are much the same as in adults. Only six infants were examined; tubercle bacilli were found in the stools of all but one, confirming the diagnosis of progressive pulmonary tuberculosis. These experiences confirm the rarity of "open" tuberculosis in children, and testify against the assumption that the tubercle bacilli get into the stools by way of the blood. If this were the case, the positive findings would probably have been more numerous.

Ugeskrift for Læger, Copenhagen

December 14, 1916, LXXVIII, No. 50, pp. 2171-2212

128 *Chronic Habitual Constipation. (Bidrag til den kroniske habituelle Obstipations Klinik og Røntgenologi. III.) T. E. H. Thaysen.—p. 2171. Commenced in No. 49, p. 2113.

December 21, No. 51, pp. 2213-2336

129 Chronic Lacrimation and Its Treatment. (Det kroniske Taareflod. Med Henblik paa Dacryocystorhinostomien og Exstirpation af Glandula lacrymalis.) B. Strandbygaard.—p. 2213.

December 29, No. 52, pp. 2337-2350

130 *Influence of Thyroid Treatment on Standard Metabolism. (Thyreoidinets Indflydelse paa Standardstofskiftet.) M. Krogh.—p. 2337.

128. **Chronic Constipation.**—Thaysen devotes his third article on this subject to what he calls *Ascendensobstipation*, the feces sojourning abnormally long in the ascending colon and first part of the transverse colon. There may be excessive or deficient contractions of this part of the bowel. In thirteen of Thaysen's twenty-two cases of this ascending type of chronic constipation the stasis was restricted to the ascending colon, and the Roentgen findings showed the atonic or spastic conditions responsible for the constipation. He reproduces some of the roentgenograms. In the other cases the roentgenograms showed stasis of feces along the ascending colon and beyond. Adhesions may be responsible for stasis in the descending colon, but this seems to occur but rarely, the trouble here being of functional nature in the majority of cases, either spasmodic contraction or atony or a combination of both. Nine of his twenty-three cases were of the spastic type, and even in the others there were occasionally symptoms suggesting spasmodic contraction. He calls attention to the fact that in six of the nine spastic cases the pains were either exclusively or much stronger in the left than the right side. In only two were they restricted to the right side; in one case to the epigastrium. The tenderness likewise was most pronounced over the regions where the pains were felt most. This suggests that when there is spastic contraction in the ascending or transverse colon, there must be an accompanying spasm in the descending colon. Among the fourteen patients with constipation from atony, four had no pains in the colon region, six had pains in the right iliac fossa, two in the left and two on both sides. The roentgenograms show that the ascending colon is not dilated with this "ascending" constipation. It is liable to lead to the erroneous diagnosis of appendicitis, especially of "recurrent" appendicitis, while mucous colitis rarely entails appendicitis. Four of Thaysen's patients had a temperature somewhat above normal along with pains in the right iliac fossa confirming the assumption of appendicitis. Of Stierlin's eight patients of this type four had had appendicectomy done. The disturbances in such cases persist after removal of the appendix as this does not get rid of the cause. In short, he concludes, the discovery of *Ascendensobstipation* should contraindicate appendicectomy, even when everything seems to indicate chronic appendicitis.

130. **Influence of Thyroid Secretion on the Standard Metabolism.**—Krogh has had occasion to record the metabolic findings in numbers of persons with exophthalmic goiter and myxedema, and has been amazed at the remarkable deviations from normal in certain respects. In one case of exophthalmic goiter the standard metabolism was found 80 per cent. above normal, and in a myxedema patient 40 per cent. below normal. It is thus rendered evident that the secretion of the thyroid promotes the metabolic changes. This assumption was confirmed by experiments on five frogs, described in detail. The metabolic findings showed a pronounced increase under the action of thyroidin, although the animals were entirely under the influence of an anesthetic.